Jim Scholl
City Manager

THE CITY OF KEY WEST
P.O. BOX 1409
KEY WEST, FL 33041-1409

525 Angela Street
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jscholl@keywestcity.com

May 22, 2011

Subject: Emergency Authorization of Resolution 12-2400: Approval of Task Order 5-12 with CH2MHILL for evaluation, testing and development of a Statement of Work of the electrical switchgear located at the Navy Mole Pier

Dear City Commission,

Due to the Navy's request that this Task Order be completed by 24 April 2012 to enable repairs to be completed by 1 September in support of a Navy Fleet Exercise, I am authorizing that this task order be approved on this date. This work shall be in concurrence with the In-Kind Project Approval Letter dated 22 March 2012 and the attached Executive Summary.

Sincerely,

JKScholl

Jim Scholl
City Manager

TASK ORDER 5-12 PORTS

ENGINEERING SERVICES FOR THE EVALUATION, TESTING AND STATEMENT OF WORK FOR MAINTENANCE AND REPAIRS OF THE NAVY MOLE ELECTRICAL DISTRIBUTION SYSTEM

This TASK ORDER 5-12 PORTS is issued under the terms and conditions of the MASTER AGREEMENT TO FURNISH GENERAL ENGINEERING SERVICES TO THE CITY OF KEY WEST ("AGREEMENT") between the City of Key West ("CITY") and CH2M HILL Engineers, Inc. ("ENGINEER") executed on September 18, 2007, which is incorporated herein by this reference.

A. SCOPE OF SERVICES

Specific services which the ENGINEER agrees to furnish are summarized on the attached statement entitled TASK ORDER 5-12 PORTS "SCOPE OF SERVICES." The "Scope of Services" defines the work effort anticipated for the Task Order. This Task Order, when executed, shall be incorporated in and shall become an integral part of the September 18, 2007, Master Agreement.

B. TIME OF COMPLETION

Work under this Task Order will begin immediately following acceptance and completed expeditiously subject to coordination with the City of Key West staff. Work may be performed at any time as requested by the CITY within 12 months after the date of execution of this Task Order, at which time the Task Order will expire.

C. COMPENSATION

Compensation for labor portion of TASK ORDER 5-12 PORTS, Task A will be on a lump sum fee basis as stipulated in Article 2, Paragraph 2.1 of the AGREEMENT. Compensation for all expenses will be on a Cost Reimbursable-Per Diem basis as stipulated in Article 2, Paragraph 2.2 of the AGREEMENT. The estimated compensation is shown on the attached statement entitled TASK ORDER 5-12 PORTS COMPENSATION.

D. ACCEPTANCE

By signature, the parties each accept the provisions of this TASK ORDER 5-12 PORTS, and authorize the ENGINEER to proceed at the direction of the CITY's representative in accordance with the "SCOPE OF SERVICES." Start date for this project will be no later than ten (10) days after execution of this authorization.

For CH2M HILL Engineers, INC.

By: _____
William D. Beddow, P.E.
Vice President

_____
Andrew H. Smyth, P.E.
Key West Office Manager

For CITY OF KEY WEST

By: _____
Jim Scholl
City Manager

Dated the 26TH day of MARCH, 2012

ATTEST: _____

TASK ORDER 5-12 PORTS

ENGINEERING SERVICES FOR THE EVALUATION, TESTING AND STATEMENT OF WORK FOR MAINTENANCE AND REPAIRS OF THE NAVY MOLE ELECTRICAL DISTRIBUTION SERVICES

SCOPE OF SERVICES

Project Description

The City of Key West (CITY) is working with the Navy to repair the existing electrical services on at the Mole Pier. The Navy has performed a visual inspection of the four (4) existing 13.8 kV to 480 V unit substations with corresponding switchgear that are used to provide shore power to ships berthed at the Mole Pier. The report identified that all electrical equipment is showing signs of significant deterioration due to the high salt environment. This equipment is further described in the design drawings (Exhibit A) navy drawings contract number N62427-03-C-0154 sheets E-1 through E-20A and as further described in field report dated February 2012 (Exhibit B)

The Navy is scheduling the arrival of a large number of Navy vessels planned to be berthed at the Mole Pier in September of this year. The Navy, in conjunction with the CITY has a mutual goal of making the required maintenance, repair and/or replacement to the existing equipment prior to the vessels arriving.

Due to the accelerated schedule and limited time to accomplish the repairs, the CITY has requested that the ENGINEER provide the services required to prepare a "statement of work" that will be utilized by the CITY and Navy to bid and construct the improvements.

Purpose

The CITY has requested that the ENGINEER provide engineering services for the evaluation, testing and preparation of statement of work for the Mole Pier electrical maintenance and repairs.

Scope of Services

The scope of services provided below addresses the work to be completed for the project. The scope of work for this project will result in the following deliverables:

- Evaluation and testing of the existing electrical equipment
- Provide an engineer's statement of probable construction costs.
- Prepare Statement of Work for recommended repairs

Task A – Evaluation, Testing and Statement of Work

The Engineer will provide data collection, field investigations, testing and evaluations sufficient to provide a detailed statement of work to be used to construct the electrical repairs at the Mole Pier.

A.1 Field Assessment

The Engineer will visit the site to gather existing data, evaluate, document and photograph the existing electrical equipment and current condition. During the site visit the Engineer will obtain existing data, including record drawings and manufacturers information use in developing the standards for the Statement of work.

Additionally the engineer will determine the amount of electrical testing required and will develop a scope of work for maintenance, repair and testing to be used in Task A.2.

A.2 Electrical Maintenance, Repair and Testing

The Engineer shall retain services of a InterNational Electrical Testing Association (NETA) certified technician(s) to perform maintenance, repair, and testing services on the existing equipment according to ANSI/NETA 2011 Standard for Maintenance Testing Specifications.

The testing services will be summarized in a report which will include equipment suggested for replacement or repair and equipment which may be retained in current condition. The testing report will also confirm the level of effort and the amount of repair/replacement of materials that will be included in the Statement of Work.

The Engineer and certified technician will prepare an evaluation report documenting the results of the maintenance, repairs, and testing required to bring entire electrical shore power on Mole pier up to 100% operation by August 31, 2012. The report will include a discussion of field procedures, test data, and a bill of materials for equipment requiring replacement.

Based on the information obtained in the report and the forthcoming modified statement of work the ENGINEER will finalize the results and recommendations for repair and replacement.

An allowance of $20,000 is included as part of this task to cover the cost of retaining a NETA certified technician.

The equipment to be evaluated and tested:

1. Six (6) S&C, SF-6, 15 kV rated switches
2. Four Unit Substations – each unit substation includes:
   a. Oil Filled Transformer
   b. 480 Volt Cutler Hammer Circuit Breakers, CTs, relays, and control circuitry
   c. 15 kV cable from SF-6 switch to each termination cabinet of each unit substation

Deliverables

- Four (4) copies of the testing report.

A.3 Statement of Work

During this subtask, the ENGINEER will prepare the Statement of Work for the Navy and City to utilize for procuring construction services.

Specific work activities in this task are identified below:

- Draft preliminary Statement of work for Navy/City review;
  - Develop technical information required for the replacement and repair of the existing electrical equipment.
  - Prepare/modify existing drawings with photo references for use with the construction package
- Prepare engineer's statement of probable construction costs.
- Conduct a review meeting and incorporate review comments from City and Navy into design documents, and submit final Statement of Work to the CITY

Deliverables

- Electronic copies: Draft Statement of Work
- Two (2) copies: Engineers probable construction cost estimate
- Eight (8) copies: Final Statement of Work, including drawings and technical information and two (2) CD's in PDF format.

Assumptions

The following assumptions were used in the development of this Task Order

- The Configuration of connection existing at the MOLE pier for water, sewer and electrical are compatible with the vessels which will moor at the existing MOLE Piers
- Bid phase and construction phase services are not included in this scope of work.
- No permits are required for the proposed work. Any local permits required will be obtained by awarded construction contractor.
- Electrical equipment can be de-energized during evaluations and testing tasks.
- No work will be completed on the existing water and sewer utilities.
- Work on this entire project, including all maintenance, repairs and testing will be completed by August 31, 2012. This task order shall be completed and delivered by May 4, 2012.
- Meetings will be held in Key West and attended by up to two (2) consultant's staff, additional consultants staff may attend via conference call.
- Consultants and City's QC reviews will occur concurrently in order to meet schedule.
- The design will be based on the federal, state and local codes and standards in effect at the start of the project. Any changes in these codes may necessitate a change in scope.

- The Statement of Work documents will be prepared for a single construction contract.
- It will be assumed that all projects will be located in City/Navy owned property.
- The City will coordinate and assist in all Navy involvement and Engineers site visits.
- Bid phase services will be completed by City/Navy.
- Any labor and expenses required to address construction claims, unforeseen subsurface considerations or additional construction time requested by the CONTRACTOR or OWNER will be considered as "Additional Services".

Obligations of the CITY

To assist meeting schedule and budget estimates contained in this proposal, the CITY will provide the following:

- The CITY will provide available drawings and manufacturer's information for electrical, water and wastewater utilities.
- Prompt review and comment on all deliverables. Review comments shall be submitted back to the Consultant within one week of deliverable.
- Facilitate access to any required facilities.
- Attendance of key personnel at meeting as requested.

Additional Services

The ENGINEER will, as directed, provide additional services that are related to the project but not included within this Scope of Services. These and other services can be provided, if desired by the CITY, as an amendment to the Task Order. Work will begin for the Additional Services after receipt of a written notice to proceed from the CITY. Additional services may include, but are not limited to, the following:

- Additional design services if requested by the City
- Permitting phase services
- Bid Phase Services
- Procurement Services
- Construction Phase Services

Compensation

The estimated compensation for TASK ORDER 5-12 PORTS is shown on Attachment A entitled TASK ORDER 5-12 PORTS, COMPENSATION.

Completion Dates

The proposed completion dates for the tasks are as follows:

Site Visit	2 weeks after notice to proceed
Draft Statement of Work and Testing Scope	1 week after site visit
Electrical Testing and Cleaning	TBD
Submit Final Statement of Work	2 weeks after receipt of City draft review comments

Attachment A

TASK ORDER 5-12 PORTS COMPENSATION

TASK ORDER 5-12 PORTS COMPENSATION

ENGINEERING SERVICES FOR THE EVALUATION, TESTING AND STATEMENT OF WORK FOR MAINTENANCE AND REPAIRS OF THE NAVY MOLE ELECTRICAL DISTRIBUTION SYSTEM

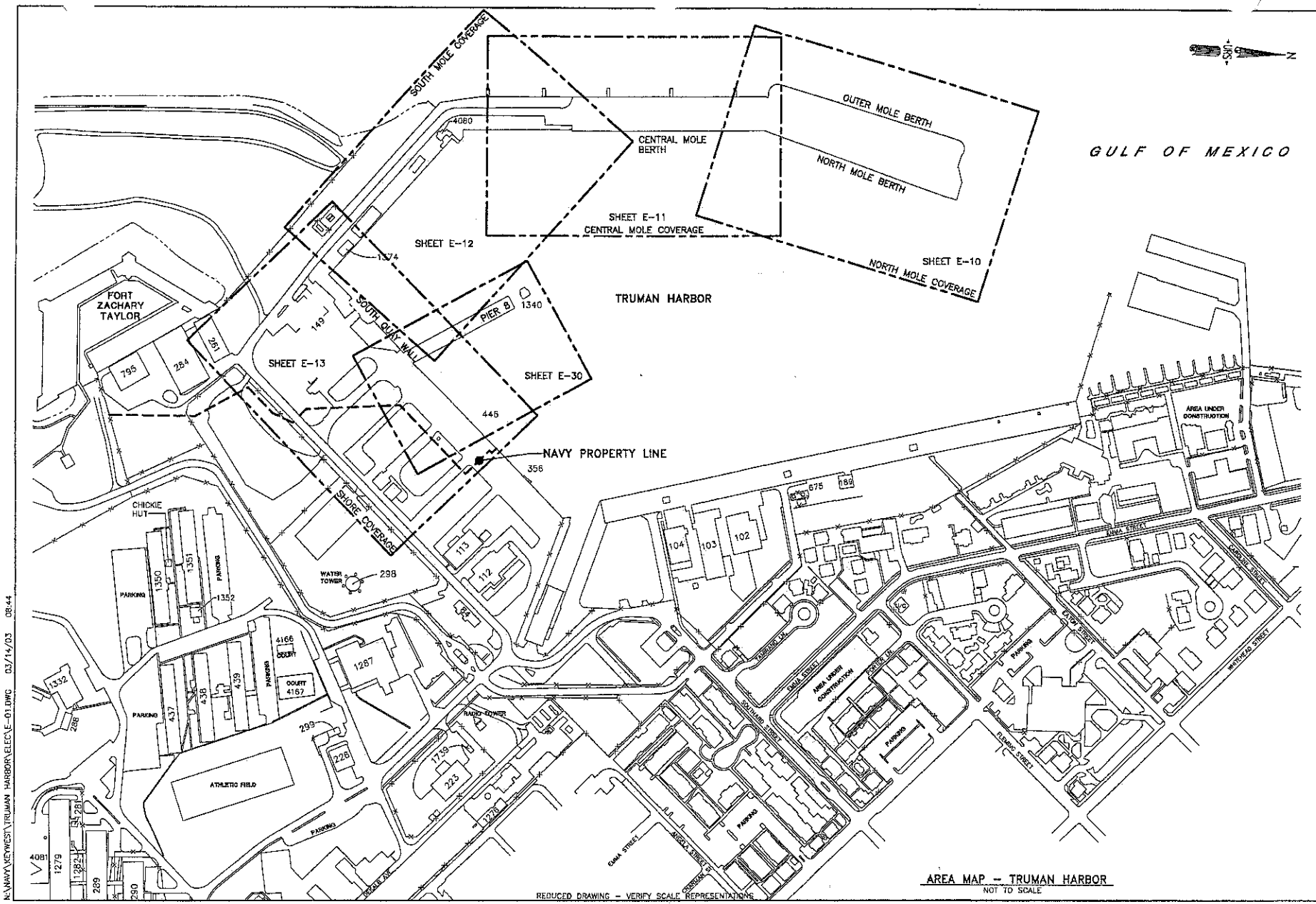
Task	Hours	Labor	Expenses	Total Cost
Task A - Evaluation, Testing and Statement of Work	207	$27,150	$22,200	$49,350
Total	**207**	**$27,150**	**$22,200**	**$49,350**

COMPENSATION BREAKDOWN Task Order 5-12 PORTS						
TASK NO.	**TASK DESCRIPTION**	**HOURLY RATE**	**TOTAL HOURS**	**LABOR**	**EXPENSES**	**TOTAL COST**
A	**Evaluation, Testing, SOW**					
	Principal PM/Principal Technologist	$172.00	22	$3,784		$3,784
	Senior Technologist/Senior PM	$158.00	45	$7,110		$7,110
	Senior Professional	$148.00	76	$11,248		$11,248
	Project Professional	$122.00	8	$976		$976
	Assoc Engineer	$110.00	0	$0		$0
	Tech 4	$ 93.00	16	$1,488		$1,488
	Specification Processor	$ 84.00	8	$672		$672
	Senior Project Assistant	$ 63.00	14	$882		$882
	Clerical	$ 55.00	18	$990		$990
	(2) - 2 Day trip to KWF				$2,000	$2,000
	Electrical Testing Sub Allowance				$20,000	$20,000
	Printing/Reprographics/Shipping				$200	$200
Evaluation, Testing, SOW SUBTOTAL			207	$27,150	$22,200	$49,350
PROJECT TOTALS						
	TOTAL HOURS		207			
	TOTAL FEE ESTIMATE			$27,150	$22,200	$49,350
TO 5-12 PORTS TOTAL			**207**	**$27,150**	**$22,200**	**$49,350**

Exhibit A

NAVY DRAWINGS CONTRACT NO. N62427-03-C-0154

SHEETS E-1 THROUGH E-20A



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URS Group, Inc.

DRAWING REVISIONS

KEY WEST, FLORIDA

NAVAL AIR FACILITY

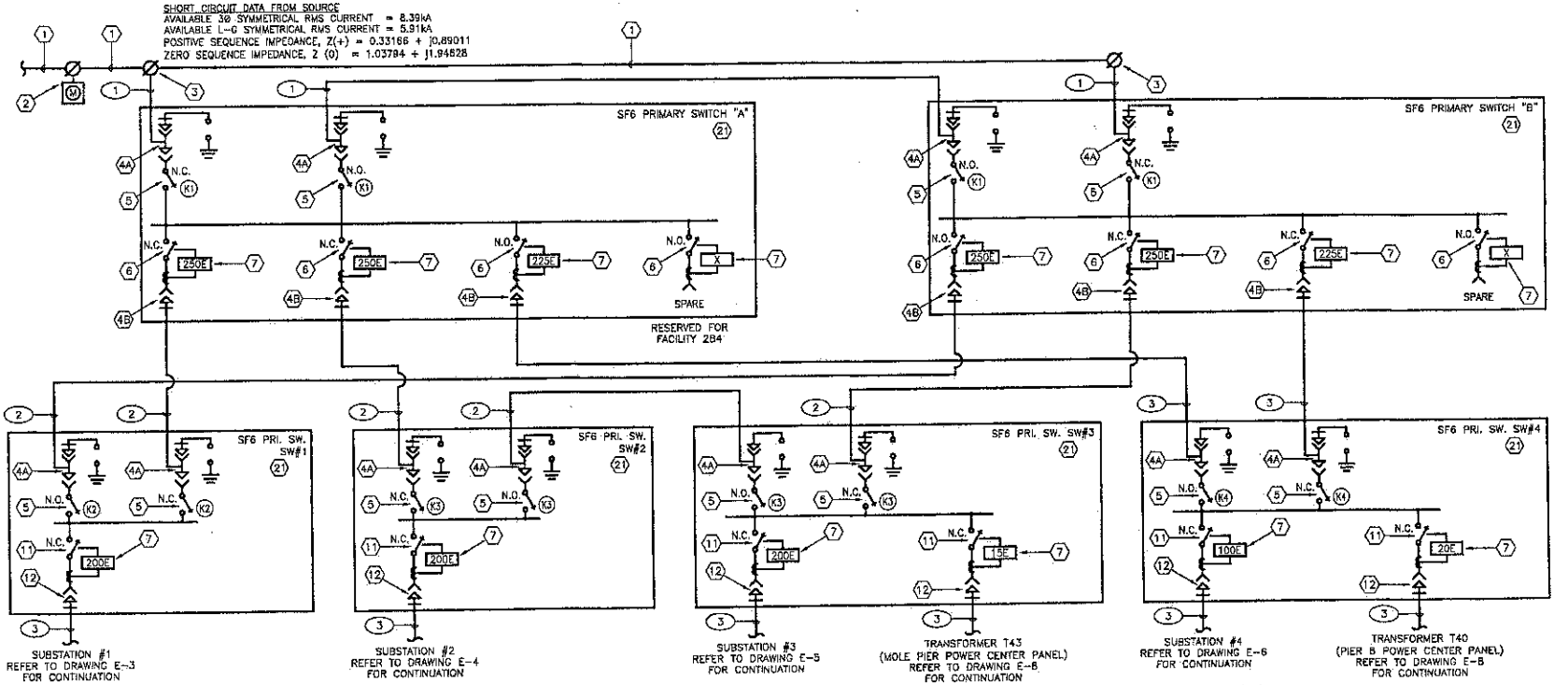
TRUMAN HARBOR REPAIRS

ELECTRICAL LOCATION PLAN

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE
CODE I.D. NO. 80081
DRAWING SIZE: D
SPEC. NO. 06-03-0154
CONTRACT CONTR. NO.
N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-1



GENERAL NOTES:

1. ARRANGE, SCHEDULE, COORDINATE, AND PAY FOR THE SERVICES OF THE ELECTRICAL POWER UTILITY SERVICE PROVIDER TO COMPLETE THE WORK SPECIFIED TO BE PERFORMED BY THE ELECTRICAL POWER UTILITY SERVICE PROVIDER.

KEY NOTES:

(1) OVERHEAD 13.8kV DISTRIBUTION

(2) UTILITY POLE WITH METER

(3) UTILITY POLE WITH SERVICE DROPS. TO BE PROVIDED BY ELECTRICAL POWER UTILITY SERVICE PROVIDER. PROVIDE SUFFICIENT SLACK IN PRIMARY CABLES AT TOP OF UTILITY POLE FOR TERMINATION BY ELECTRICAL POWER UTILITY SERVICE PROVIDER. COORDINATE EXACT LENGTH OF SLACK CABLES REQUIRED WITH ELECTRICAL POWER UTILITY SERVICE PROVIDER BEFORE INSTALLING PRIMARY CABLES. ELECTRICAL POWER UTILITY SERVICE PROVIDER TO TERMINATE PRIMARY CABLES. FURNISH PRIMARY CABLE TERMINATION KITS TO THE ELECTRICAL POWER UTILITY SERVICE PROVIDER FOR THEIR USE IN TERMINATING THE PRIMARY CABLES.

(4A) 600A DEADBREAK ELBOW CONNECTOR WITH PROVISIONS FOR PIGGYBACK 200A LOADBREAK ELBOW STYLE LIGHTNING ARRESTERS (MOV) AND INSERTS.

(4B) 600A DEADBREAK ELBOW CONNECTOR AND INSERTS.

(5) 600A LOADBREAK SWITCH WAY.

(6) 600A LOADBREAK PROTECTED WAY.

KEY NOTES CONT'D:

(7) PROGRAMMABLE PROTECTIVE TRIP DEVICE. PROTECTIVE DEVICES SHALL EMULATE E-RATED 15.5KV FUSES AS SIZED ON THE DRAWING. REFER TO DRAWING E-7 FOR TIME-CURRENT CURVES AND INTENDED SYSTEM COORDINATION.

(8) MAIN PROGRAMMABLE OVERCURRENT PROTECTIVE RELAY MONITORING TOTAL SUBSTATION LOAD. REFER TO DRAWING E-7 FOR TIME-CURRENT CURVES AND INTENDED SYSTEM COORDINATION.

(9) PROGRAMMABLE PROTECTIVE STATIC TRIP UNIT INTEGRAL TO LOW VOLTAGE CIRCUIT BREAKERS. REFER TO DRAWING E-7 FOR TIME-CURRENT CURVES AND INTENDED SYSTEM COORDINATION.

(10) BRANCH PROGRAMMABLE OVERCURRENT PROTECTIVE RELAY WITH POWER METERING / MONITORING. REFER TO DRAWING E-7 FOR TIME-CURRENT CURVES AND INTENDED SYSTEM COORDINATION.

(11) 200A LOADBREAK PROTECTED WAY.

(12) 200A LOADBREAK ELBOW TERMINATORS AND INSERTS.

(13) 200A LOADBREAK ELBOW STYLE LIGHTNING ARRESTER.

(14) LOOP FEED 4-POSITION (A-LOAD, B-LOAD, A-B, A-B-LOAD) UNDER OIL SWITCH.

(15) 480 POWER OUTLET RECEPTACLE.

(16) MAIN DIGITAL MULTIMETER.

KEY NOTES CONT'D:

(17) <NOT USED>

(18) MOLE POWER CONTROLLER. REFER TO DRAWING E-8 FOR REMOTE CIRCUIT BREAKER CONTROL SCHEMATIC WIRING DIAGRAM.

(19) CURRENT TRANSFORMERS (CTs) LOCATED ON SECONDARY BUSHINGS OF UNIT SUBSTATION STYLE TRANSFORMERS.

(20) CURRENT TRANSFORMERS AS INTEGRAL PART OF POWER CIRCUIT BREAKERS FINAL CT RATIOS TO BE DETERMINED BY POWER CIRCUIT BREAKER MANUFACTURER.

(21) SF6 MEDIUM VOLTAGE SWITCH:
RATED MAXIMUM VOLTAGE = 15.5kV
RATED WITHSTAND IMPULSE VOLTAGE = 95kV BIL
CONTINUOUS AND LOAD INTERRUPTING CURRENT = 600A
SHORT-TIME CURRENT = 12kA RMS SYM.
SHORT-CIRCUIT INTERRUPTING CURRENT = 12kA RMS SYM.

(22) MOTOR OPERATED POWER CIRCUIT BREAKER.

KIRK KEY INTERLOCK GROUPING

(K1) INTERLOCK SWITCHES SO THAT AT LEAST ONE OF THE FOUR PRIMARY SWITCHES ARE OPEN AT ANY MOMENT IN TIME.

(K2) INTERLOCK SWITCHES SO THAT AT LEAST ONE OF THE TWO LINESIDE SWITCHES ARE OPEN AT ANY MOMENT IN TIME.

(K3) SAME AS GROUPING 1 ABOVE.

(K4) SAME AS GROUPING 2 ABOVE.

FEEDER LEGEND:

(1) (3) 750KCMIL PH. PRIMARY CABLE AND (1) #2 AWG THWN GND.

(2) (3) 250KCMIL PH. PRIMARY CABLE AND (1) #4 AWG THWN GND.

(3) (3) 1/0 AWG PH. PRIMARY CABLE AND (1) #4 AWG THWN GND.

(4) (8) SETS: (3) 750KCMIL PH. AND (1) 750KCMIL GND.

(5) (3) 750KCMIL PH. AND (1) #2 AWG GND.

(6) (4) SETS: (3) 750KCMIL PH. AND (1) 250 KCMIL GND.

(7) (3) 1/0 AWG PH. AND (1) 1/0 AWG GROUNDED SERVICE CONDUCTOR.

(8) (3) #4 AWG PH., (1) #4 AWG NEUT., AND (1) #8 AWG GND.

(9) (3) #4 AWG PH. AND (1) #8 AWG GND.

(10) (3) #6 AWG PH., (1) #6 AWG NEUT., AND (1) #8 AWG GND.

(11) (2) #8 AWG PH. AND (1) #10 AWG GND.

(12) (1) #10 AWG PH., (1) #10 AWG NEUT., AND (1) #10 AWG GND.

(13) (1) #12 AWG PH., (1) #12 AWG NEUT., AND (1) #12 AWG GND.

CT RATINGS:

CT RATIO	RELAY CLASS	RF	METERING CLASS
400/5	C100	4.0	0.3 THRU B-0.2
2000/5	-----	1.5	0.3 THRU B-1.8
3200/5	-----	1.5	0.3 THRU B-1.8
5000/5	C800	1.5	0.3 THRU B-1.8

REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

DRAWING REVISIONS

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

PRIMARY ONE LINE DIAGRAM

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE

CODE I.D. NO. 80091
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CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
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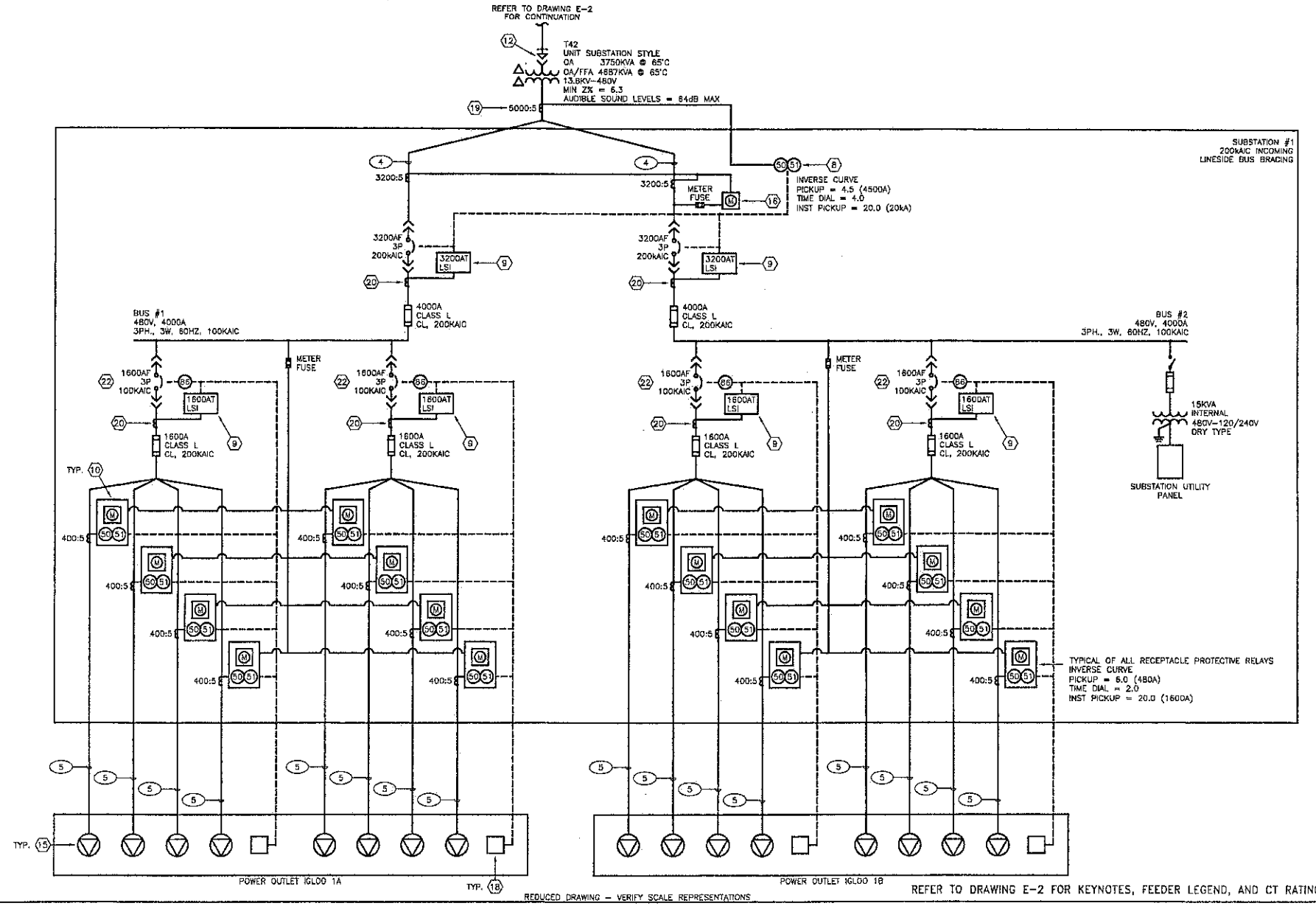
E-2



URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607
NSN KEY/ST WK DATE DW DSN# CHKD WK/DEF DATE
STAMPED #1 TECHNICAL MANAGER PIC

DRAWING REVISIONS

Rev.	Description	Prep By	Date	Approved

KEY WEST, FLORIDA
NAVAL AIR FACILITY
TRUMAN HARBOR REPAIRS
SECONDARY ONE LINE DIAGRAM - SUBSTATION #1

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE
CODE I.D. NO. 80091
DRAWING SIZE:
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CONSTRN. CONTR. NO. N62467-03-C-015
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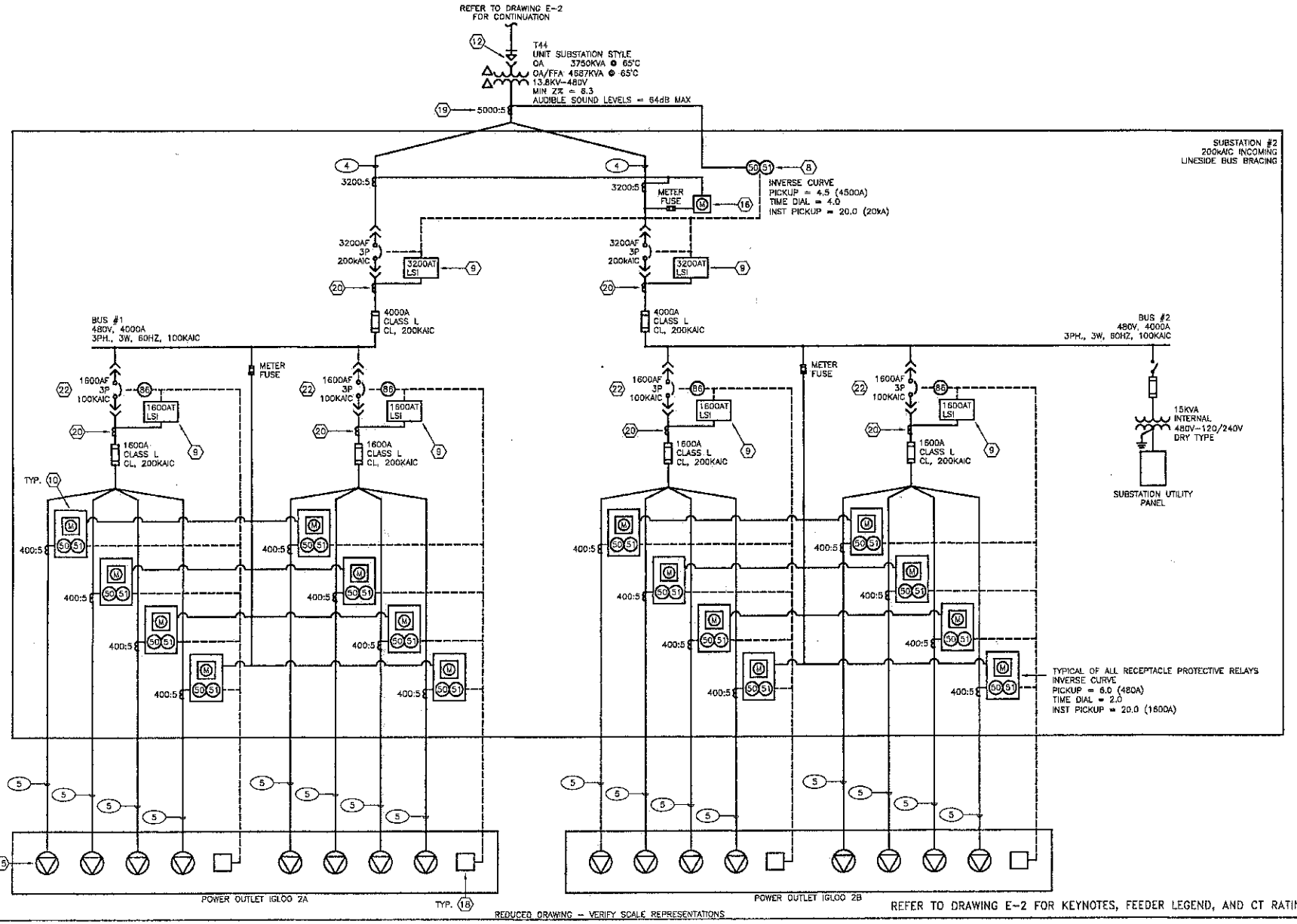

URS Group, Inc.

DRAWING REVISIONS

No.	Description	Date	Approved

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

SECONDARY ONE LINE DIAGRAM - SUBSTATION #2

APPROVED DATE CO. RES. COMMANDER, NAVFAC

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE

CODE I.D. NO. 80091
DRAWING SIZE: D
SPEC.NO. 00-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.

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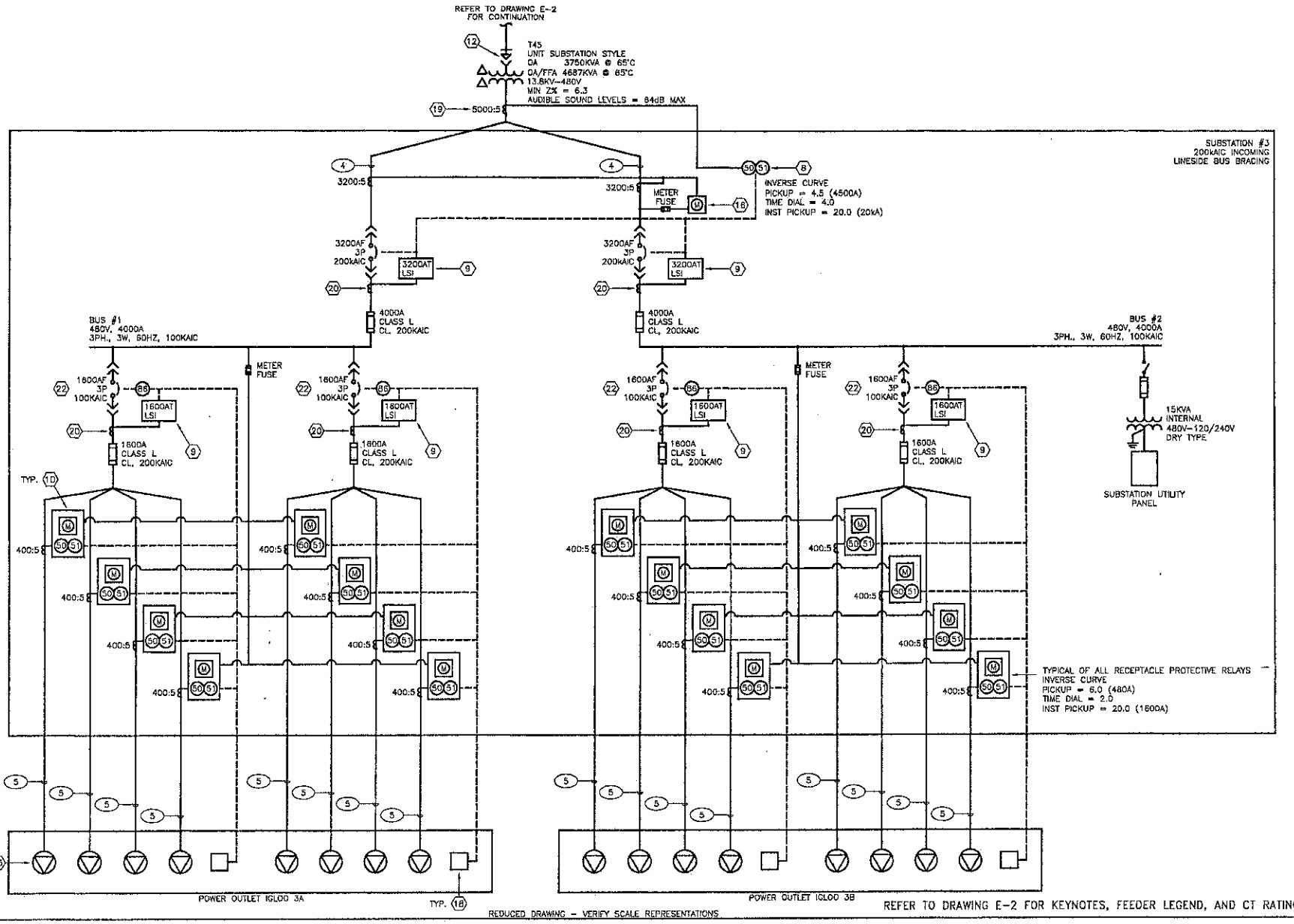

URS Group, Inc.
2155 West Cypress Creek Road, Fort Lauderdale, FL 33309
Tampa, FL
DRAWING REVISIONS
Description | Prep. By | Date | Approved

NAVAL AIR FACILITY
KEY WEST, FLORIDA
TRUMAN HARBOR REPAIRS
SECONDARY ONE LINE DIAGRAM - SUBSTATION #3
TO BE DEMOLISHED

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE
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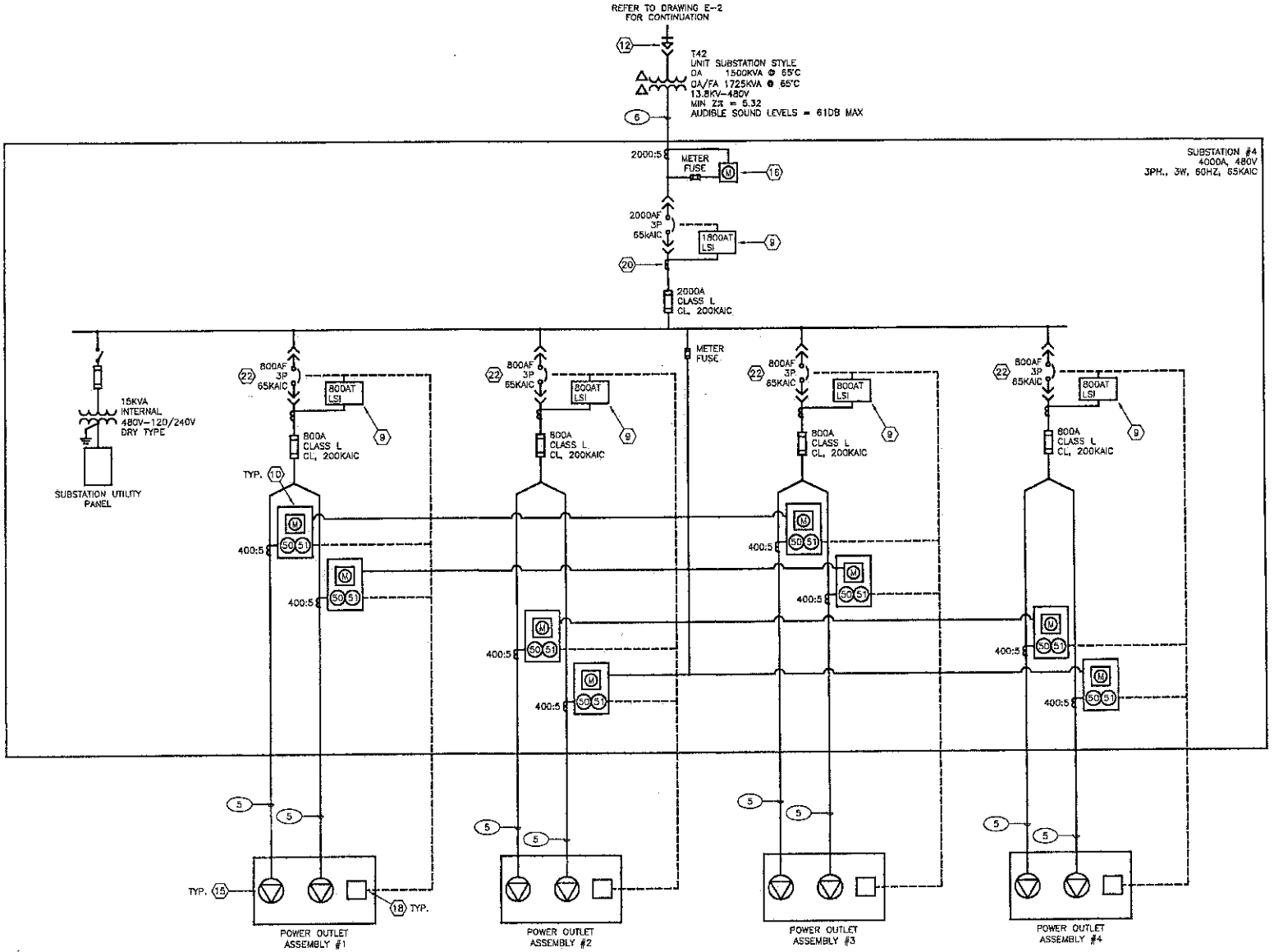
E-5



REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS

REFER TO DRAWING E-2 FOR KEYNOTES, FEEDER LEGEND, AND CT RATINGS

URS Group, Inc.
7550 West Courtney Campbell Causeway
Tampa, FL 33607

DRAWING REVISIONS

No.	Description	Prep. By	Date	Appvd.

DSGN BERLY | DWN SANG | CK SHAH | WALKER | DATE
SUBMITTED BY
TECHNICAL BRANCH
PIC

NAVAL AIR FACILITY
KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

SECONDARY ONE LINE DIAGRAM - SUBSTATION #4

APPROVED
RPE STR. CERTIFICATE NUMBER
PIC

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE

CODE I.D. NO.	80091
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CONSTRN. CONTR. NO.	N62467-03-C-0154
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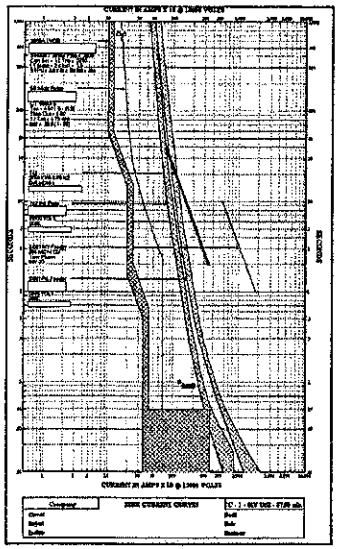
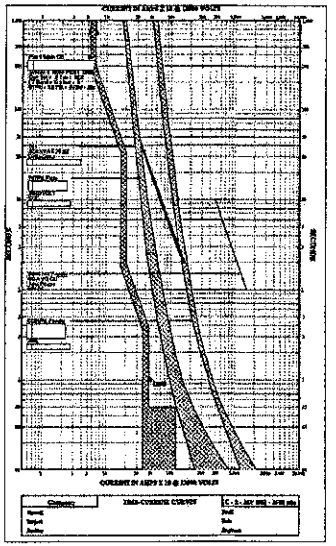
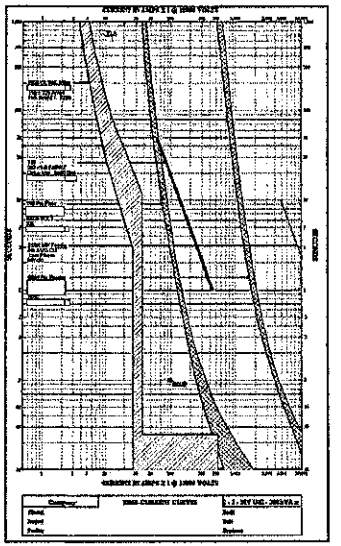
E-6



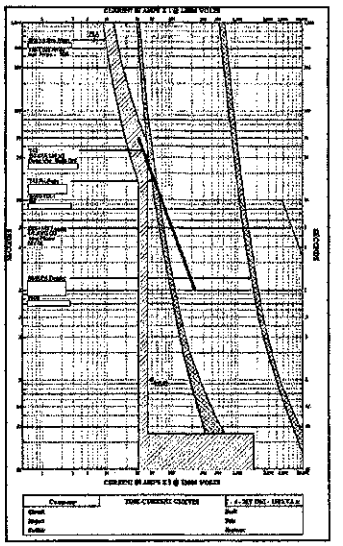
1 / E-7 MV – UTIL THRU 3750kVA XFMR MAIN
NTS



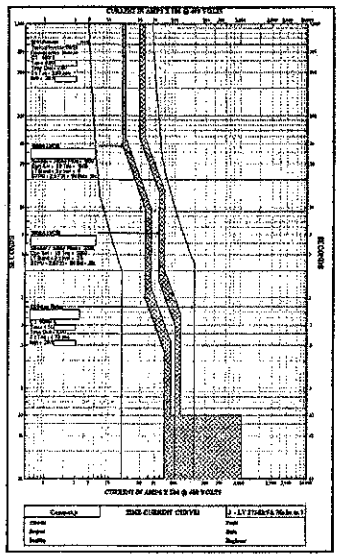
2 / E-7 MV – UTIL THRU 1500kVA XFMR MAIN
NTS



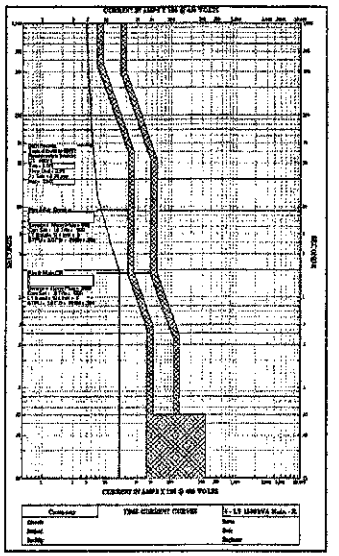
3 / E-7 MV – UTIL THRU 300kVA XFMR MAIN
NTS



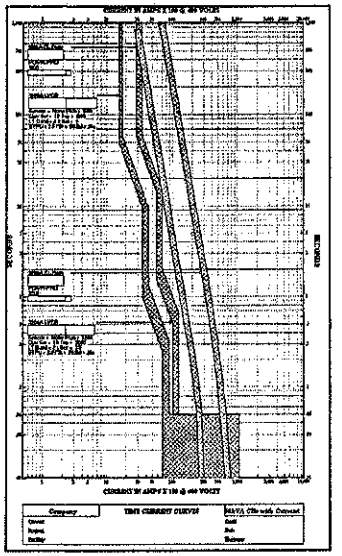
4 / E-7 MV – UTIL THRU 150kVA XFMR MAIN
NTS



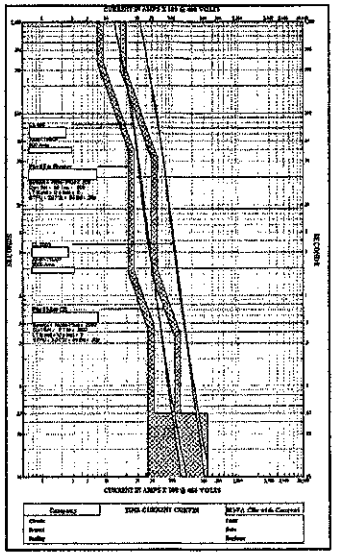
5 / E-7 LV – 3750kVA XFMR MAIN THRU RECP.
NTS



6 / E-7 LV – 1500kVA XFMR MAIN THRU RECP.
NTS



7 / E-7 LV – MOLE PIER CURRENT LIMITING FUSES
NTS



8 / E-7 LV – PIER 8 CURRENT LIMITING FUSES
NTS

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

URS Group, Inc.
7956 Main St. Suite 101, Columbia, SC 29203
Tel: (803) 771-7650 Fax: (803) 771-8908

DRAWING REVISIONS

Rev.	Description	Prep. By	Date	Approved

DSGN: KEMLY | DR: DAVIS | CHK: CRAIG
SUPV: KEMLY | DY: RYDE | WALKER
SUBMITTED BY:
TECHNICAL SERVICES

KEY WEST, FLORIDA
NAVAL AIR FACILITY
TRUMAN HARBOR REPAIRS
SYSTEM TIME-CURRENT COORDINATION CURVES

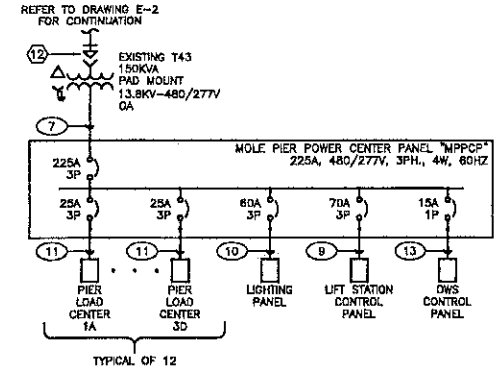
Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

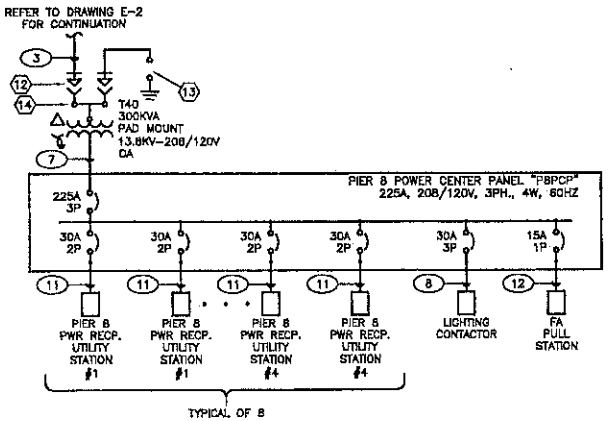
90% SUBMITTA
17 MARCH 200

RECORD DRAWING DAT

CODE I.D. NO. 8009
DRAWING SIZE:
SPEC NO. 06-03-01
CONSTRN. CONTR. NO.
N62467-03-C-01
NAVFAC DRAWING NO.

SHEET OF
E-7





NAME: SUBSTATION UTILITY PANEL
VOLTAGE: 120/240V
PHASE: 1
WIRE: 3
BUS RATING: 100A
MAIN BKR RATING: MLO
MIN. KAIC RATING: 10KAIC
LOCATION: UNIT SUBSTATION UTILITY COMPARTMENT
MOUNTING: SURFACE
FED FROM: 60A/2P FUSED DISCONNECT SWITCH TAP TO SUBSTATION MAIN BUS

CKT NO.	CIRCUIT DESCRIPTION	LOAD (kVA)	BKR AMPS	PH	BKR AMPS	LOAD (kVA)	CIRCUIT DESCRIPTION	CKT NO.
1	LIGHTS	0.7	20	- A -	20	0.25	HEATER	2
3	RECEPTACLE	0.18	20	- B -	20	0.25	HEATER	4
5	SPARE	-	20	- A -	20	0.25	HEATER	6
7	SPARE	-	20	- B -	20	0.25	HEATER	8
9	SPARE	-	20	- A -	20	0.25	HEATER	10
11	SPARE	-	20	- B -	20	0.25	HEATER	12
13	SPARE	-	20	- A -	20	0.25	HEATER	14
15	SPARE	-	20	- B -	20	-	SPARE	16
17	POWER SUPPLY / BATTERY CHARGER	0.1	20	- A -	20	-	SPACE	18

	A	B	TOTAL
CONNECTED LOAD (PER PHASE kVA):	1.8	.93	2.73
CONNECTED LOAD (PER PHASE AMPS):	15	7.75	

FEATURES: STAINLESS STEEL ENCLOSURE

REFER TO DRAWING E-2 FOR KEY NOTES AND FEEDER LEGEND

REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607

DRAWING REVISIONS

Rev.	Description	Prep. By	Date	Appvd.

NAVAL AIR FACILITY
KEY WEST, FLORIDA
TRUMAN HARBOR REPAIRS
SCHEMATIC WIRING DIAGRAMS
APPROVED
90% SUBMITTAL
17 MARCH 2003

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

RECORD DRAWING DATE
CODE I.D. NO. 80091
DRAWING SIZE: D
SPEC.NO. 05-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-8

GENERAL NOTES:

1. THE GENERAL AND KEY NOTES ON THIS DRAWING APPLY TO DRAWINGS E-10 THROUGH E-13. SEE DRAWING G-5 FOR NOTES GOVERNING ELECTRICAL DEMOLITION WORK.

2. EXACT LOCATIONS OF UTILITY POLES PROVIDED BY ELECTRICAL POWER SERVICE PROVIDER, SHALL BE DETERMINED BY THE ELECTRICAL POWER SERVICE PROVIDER BASED SYSTEMS ENGINEERING PERFORMED BY THE UTILITY SERVICE PROVIDER.

3. PREPARE EXISTING AND NEW DUCTS/CONDUITS AND MANHOLES SPECIFIED TO RECEIVE NEW PRIMARY CABLES. DE-WATER AND CLEAN EXISTING MANHOLES IDENTIFIED TO RECEIVE NEW PRIMARY CABLES, OF DIRT, DEBRIS, AND ABANDONED CABLES/WIRES. CLEAN EXISTING DUCTS/CONDUITS IDENTIFIED TO RECEIVE NEW PRIMARY CABLES, BY PULLING A MANDREL THROUGH EACH DUCT/CONDUIT IN EACH DIRECTION, AND THEREAFTER PULLING A STIFF BRISTLE BRUSH WITH SWAB THROUGH THE DUCT/CONDUIT UNTIL DUCT/ CONDUIT IS CLEAR OF EARTH, SAND, AND GRAVEL. PROVIDE FOR DE-WATERING OF MANHOLES AS REQUIRED TO COMPLETE INSTALLATION OF NEW PRIMARY CABLES.

4. PREPARE EXISTING AND NEW DUCTS/CONDUITS AND MANHOLES SPECIFIED TO RECEIVE NEW SECONDARY WIRES. DE-WATER AND CLEAN EXISTING MANHOLES IDENTIFIED TO RECEIVE NEW SECONDARY WIRES, OF DIRT, DEBRIS, AND ABANDONED CABLES/WIRES. CLEAN EXISTING DUCTS/CONDUITS IDENTIFIED TO RECEIVE NEW SECONDARY WIRES, BY PULLING A MANDREL THROUGH EACH DUCT/CONDUIT IN EACH DIRECTION, AND THEREAFTER PULLING A STIFF BRISTLE BRUSH WITH SWAB THROUGH THE DUCT/CONDUIT UNTIL DUCT/CONDUIT IS CLEAR OF EARTH, SAND, AND GRAVEL. PROVIDE FOR DE-WATERING OF MANHOLES AS REQUIRED TO COMPLETE INSTALLATION OF NEW SECONDARY WIRES.

5. PREPARE EXISTING AND NEW DUCTS/CONDUITS AND MANHOLES FOR USE BY TELEPHONE AND CATV SERVICE PROVIDERS. DE-WATER AND CLEAN EXISTING COMMUNICATIONS MANHOLES IDENTIFIED FOR TELEPHONE AND CATV SERVICE PROVIDER USE, OF DIRT, DEBRIS, AND ABANDONED CABLES. EXISTING DUCTS/CONDUITS AND MANHOLES MAY CONTAIN ACTIVE TELEPHONE CABLES. COORDINATE CLEANING ACTIVITIES WITH TELEPHONE SERVICE PROVIDER SO THAT ACTIVE TELEPHONE CABLES ARE IDENTIFIED, PROTECTED, REMAIN UNDAMAGED, AND REMAIN IN SERVICE. CLEAN EXISTING DUCTS/CONDUITS IDENTIFIED FOR TELEPHONE AND CATV SERVICE PROVIDER USE BY PULLING A MANDREL THROUGH EACH DUCT/CONDUIT IN EACH DIRECTION, AND THEREAFTER PULLING A STIFF BRISTLE BRUSH WITH SWAB THROUGH THE DUCT/CONDUIT UNTIL DUCT IS CLEAR OF EARTH, SAND, AND GRAVEL. PROVIDE FOR DE-WATERING OF MANHOLES AS REQUIRED FOR TELEPHONE AND CATV SERVICE PROVIDERS TO COMPLETE THEIR WORK INSIDE THE MANHOLE. PROVIDE PULL ROPES FOR TELEPHONE AND CATV PROVIDER USE, IN EACH DUCT/CONDUIT IDENTIFIED FOR TELEPHONE AND CATV SERVICE PROVIDER USE. WHERE CABLE ROUTING HAS BEEN LEFT TO THE DISCRETION OF THE TELEPHONE AND CATV SERVICE PROVIDERS, COORDINATE FINAL CABLE ROUTING IN THE FIELD WITH THE TELEPHONE AND CATV SERVICE PROVIDERS.

KEY NOTES:

(1) UTILITY EASEMENT SHOWN MAY BE USED BY TELEPHONE AND CATV SERVICE PROVIDERS TO BRING TELEPHONE AND CATV SERVICES TO SITE.

(2) EXISTING UNDERGROUND UTILITY DUCT BANK CONTAINING COMMUNICATIONS CONDUITS. UTILITY SERVICE PROVIDERS MAY, AT THEIR OPTION AND RISK, USE THESE CONDUITS TO BRING TELEPHONE AND CATV SERVICES TO THE SITE.

(3) PROPOSED OVERHEAD PRIMARY ELECTRICAL POWER DISTRIBUTION TO BE PROVIDED BY ELECTRICAL POWER UTILITY SERVICE PROVIDER.

(4) PROPOSED LOCATION FOR UTILITY POLE WITH GUYS AS REQUIRED TO BE PROVIDED BY ELECTRICAL POWER UTILITY SERVICE PROVIDER.

(5) PROPOSED LOCATION FOR UTILITY POLE WITH PRIMARY METERING, TO BE PROVIDED BY ELECTRICAL POWER UTILITY SERVICE PROVIDER.

(6) PROPOSED LOCATION FOR UTILITY POLES WITH SERVICE DROPS, TO BE PROVIDED BY ELECTRICAL POWER UTILITY SERVICE PROVIDER.

(7) PROVIDE DUCT BANK, ONE ACTIVE AND ONE SPARE CONDUIT, BETWEEN UTILITY POLE AND PRIMARY MANHOLE FOR PRIMARY SWITCH "A" SERVICE DROP. PROVIDE PRIMARY SERVICE CABLES IN ACTIVE CONDUIT. STUB ACTIVE CONDUIT UP POLE TO HEIGHT SPECIFIED BY ELECTRIC POWER SERVICE PROVIDER. STUB SPARE CONDUIT UP 6" ABOVE FINAL GRADE, ADJACENT TO UTILITY POLE AND CAP FOR FUTURE USE.

(8) PROVIDE DUCT BANK, ONE ACTIVE AND ONE SPARE CONDUIT, BETWEEN UTILITY POLE AND PRIMARY MANHOLE FOR PRIMARY SWITCH "B" SERVICE DROP. PROVIDE PRIMARY SERVICE CABLES IN ACTIVE CONDUIT. STUB ACTIVE CONDUIT UP POLE TO HEIGHT SPECIFIED BY ELECTRIC POWER SERVICE PROVIDER. STUB SPARE CONDUIT UP 6" ABOVE FINAL GRADE, ADJACENT TO UTILITY POLE AND CAP FOR FUTURE USE.

(9A) PROVIDE PRIMARY SWITCHES AS DETAILED.

(9B) PROVIDE SUBSTATION AS DETAILED.

(10) PROVIDE 8'-0" LONG BY 8'-0" WIDE BY 6'-0" HIGH (INSIDE DIMENSIONS) PRECAST CONCRETE MANHOLE WITH 42" CLEAR OPENING DIAMETER HS-20 TRAFFIC LOAD RATED DUCTILE IRON LID/LID FRAME.

(11) PROVIDE 5'-0" LONG BY 5'-0" WIDE BY 6'-0" HIGH (INSIDE DIMENSIONS) PRECAST CONCRETE MANHOLE WITH 42" CLEAR OPENING DIAMETER HS-20 TRAFFIC LOAD RATED DUCTILE IRON LID/LID FRAME.

(12) PROVIDE DUCT BANK AS DETAILED. PROVIDE CABLES AND WIRES IN THESE CONDUITS AS SPECIFIED.

(13) PROVIDE TWO 4" SCH. 40 PVC CONDUITS BETWEEN UTILITY POLE AND COMMUNICATIONS MANHOLE FOR POSSIBLE USE BY TELEPHONE AND CATV SERVICE PROVIDERS. CONDUITS SHALL BE DIRECT BURIED BELOW GRADE WITH MINIMUM 36" EARTH COVER. STUB CONDUITS UP 6" ABOVE FINAL GRADE ADJACENT TO UTILITY POLE AND CAP.

(14) EXISTING UTILITY DUCT BANK CONTAINING VARIOUS COMBINATIONS OF SECONDARY ELECTRICAL POWER AND COMMUNICATIONS CONDUITS. TELEPHONE AND CATV SERVICE PROVIDERS MAY USE THESE CONDUITS TO BRING TELEPHONE AND CATV SERVICES TO PIER COMMUNICATION OUTLET ASSEMBLIES.

(15) EXISTING UTILITY DUCT BANK CONTAINING VARIOUS COMBINATIONS OF PRIMARY ELECTRICAL POWER, SECONDARY ELECTRICAL POWER AND COMMUNICATIONS CONDUITS. PROVIDE PRIMARY AND SECONDARY ELECTRICAL POWER DISTRIBUTION CABLES AND WIRES IN THESE CONDUITS AS SPECIFIED. TELEPHONE AND CATV SERVICE PROVIDERS SHALL USE THESE CONDUITS TO BRING TELEPHONE AND CATV SERVICES TO PIER COMMUNICATIONS OUTLET ASSEMBLIES.

(16) EXISTING DUCT BANK CONTAINING TWO 4" PVC CONDUITS, ONE ACTIVE AND ONE SPARE. REWORK EXISTING CONDUITS UP INTO NEW PRIMARY SWITCH AT NEW SUBSTATION. PROVIDE PRIMARY CABLES IN ACTIVE CONDUIT AS SPECIFIED.

(17) PROVIDE NEW 42" CLEAR OPENING DIAMETER HS-20 TRAFFIC LOAD RATED DUCTILE IRON LID/LID FRAME ON EXISTING MANHOLE.

(18) <NOT USED>

(19) PROVIDE NEW PIER POWER OUTLET IGLOO AS DETAILED TO REPLACE EXISTING IN EXISTING LOCATION.

(20) EXISTING DUCT BANK CONTAINING EIGHT 4" PVC CONDUITS. REWORK EXISTING CONDUITS UP INTO RECESS BELOW NEW SUBSTATION SECONDARY DISTRIBUTION SECTION AND UP INTO NEW PIER POWER OUTLET IGLOO. PROVIDE SECONDARY WIRES IN EACH CONDUIT AS SPECIFIED.

(21) PROVIDE NEW PIER POWER OUTLET IGLOO AS DETAILED IN NEW LOCATION.

(22) <NOT USED>

(23) PROVIDE NEW LOAD CENTER AS DETAILED TO REPLACE EXISTING IN EXISTING LOCATION. NEW LOAD CENTER SHALL INCLUDE A 10kVA 480V-120/240V, 1 PH. TRANSFORMER AND TEN 1P POSITION LOAD CENTER IN A STAINLESS STEEL ENCLOSURE.

(24) EXISTING 4" PVC CONDUIT UNDERGROUND. REWORK EXISTING CONDUIT UP INTO NEW LOAD CENTER. PROVIDE SECONDARY WIRES IN THIS CONDUIT TO SERVE LOAD CENTER AS SPECIFIED.

(25) PROVIDE NEW PIER COMMUNICATIONS OUTLET ASSEMBLY AS DETAILED TO REPLACE EXISTING IN EXISTING LOCATION. NEW PIER COMMUNICATIONS OUTLET ASSEMBLY SHALL INCLUDE SEPARATE SECURED COMPARTMENTS FOR FOR TELEPHONE SERVICE PROVIDER TERMINATION EQUIPMENT, CATV SERVICE PROVIDER TERMINATION EQUIPMENT, USER TELEPHONE SERVICE ACCESS, USER CATV SERVICE ACCESS, AND USER BASE COMMUNICATIONS ACCESS.

KEY NOTES CONT. . .

(26) EXISTING 4" PVC CONDUIT UNDERGROUND. REWORK EXISTING CONDUIT UP INTO NEW PIER COMMUNICATIONS OUTLET ASSEMBLY. PROVIDE THREE 1¼" OUTDOOR RATED ORANGE INNERDUCT IN THIS CONDUIT, ONE FOR TELEPHONE SERVICE PROVIDER CABLE, ONE FOR CATV SERVICE CABLE, AND ONE FOR BASE COMMUNICATIONS CABLE. EXTEND INNERDUCT UP INTO PIER COMMUNICATIONS OUTLET ASSEMBLY ENCLOSURE TO THE RESPECTIVE SERVICE TERMINATION COMPARTMENT. INNERDUCT SHALL BE CONTINUOUS FROM END TO END WITHOUT SPLICE.

(27) <NOT USED>

(28) PROVIDE NEW LIGHT POLE ON EXISTING CONCRETE FOUNDATION AS SPECIFIED. FIELD VERIFY BOLT PATTERN BEFORE PLACING ORDER FOR LIGHT POLE.

(29) EXISTING 2" PVC COATED RGS CONDUIT UNDERGROUND. PROVIDE LIGHTING CIRCUIT WIRES IN THIS CONDUIT AS SPECIFIED.

(30) <NOT USED>

(31) PROVIDE CATV PEDESTAL AS DETAILED. CATV PEDESTAL SHALL INCLUDE AN ENCLOSURE WITH BACKPANEL, MOUNTING RACK, FOUNDATIONS AND PROTECTIVE PIPE BOLLARDS. CATV SERVICE PROVIDER SHALL USE THIS PEDESTAL TO HOUSE AN AMPLIFIER.

(32) PROVIDE 3" PVC COATED RGS CONDUIT UNDERGROUND BETWEEN EXISTING COMMUNICATIONS MANHOLE AND CATV PEDESTAL. CATV SERVICE PROVIDER SHALL USE THIS CONDUIT TO ROUTE CATV CABLES TO/FROM AMPLIFIER.

(33) PROVIDE RADIO REPORTING TYPE FIRE ALARM MANUAL PULL STATION AS DETAILED.

(34) PROVIDE MOLE PIER POWER CENTER AS DETAILED.

(35) PROVIDE PVC COATED RGS CONDUIT UNDERGROUND BETWEEN MOLE PIER POWER CENTER PANEL AND SECONDARY MANHOLE AS FOLLOWS:

2½" FOR SECONDARY WIRES FROM TRANSFORMER T43 AS SPECIFIED.
2" FOR SECONDARY WIRES TO PIER LOAD CENTERS 1A THROUGH 1D AS SPECIFIED.
2" FOR SECONDARY WIRES TO PIER LOAD CENTERS 2A THROUGH 2D AS SPECIFIED.
2" FOR SECONDARY WIRES TO PIER LOAD CENTERS 3A THROUGH 3D AS SPECIFIED.
2" FOR SPARE.

(36) PROVIDE 1½" PVC COATED RGS CONDUIT UNDERGROUND BETWEEN MOLE PIER POWER CENTER LIGHTING CONTACTOR AND SECONDARY MANHOLE FOR LIGHTING CIRCUIT WIRES AS SPECIFIED.

(37) PROVIDE 1¼" PVC COATED RGS CONDUIT UNDERGROUND BETWEEN MOLE PIER POWER CENTER PANEL MOLE LIFT STATION CONTROL PANEL.

(38) PROVIDE 1" PVC COATED RGS CONDUIT UNDERGROUND BETWEEN MOLE PIER POWER CENTER PANEL AND MOLE OWS CONTROL PANEL.

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

UHS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607
NO. 00000921 DATE 08/06
DES. BERLY
DR. BERLY
CH. CHAD WALKER
SUBMITTED BY: CHAD WALKER
TECHNICAL BRANCH

DRAWING REVISIONS

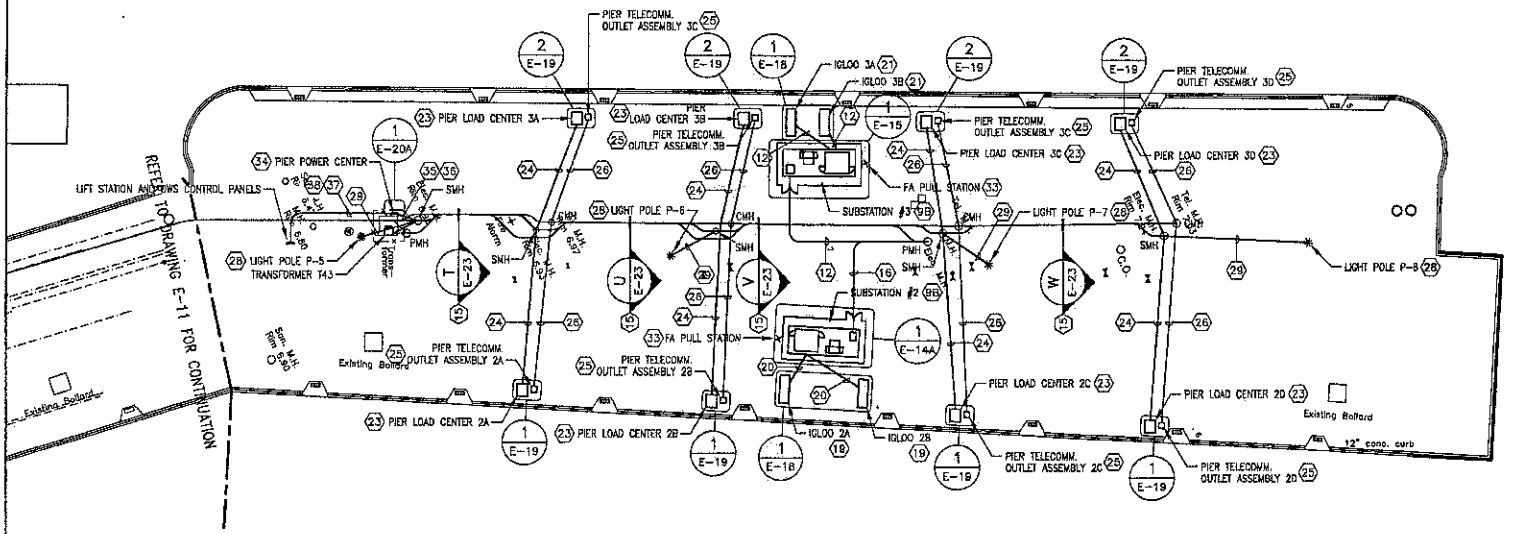
Rev.	Description	Prep. By	Date	Approved

NAVAL AIR FACILITY
KEY WEST, FLORIDA
TRUMAN HARBOR REPAIRS
KEY NOTES FOR DRAWINGS E-10 THROUGH E-13
DATE
APPROVED

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE
CODE I.D. NO. 80091
DRAWING SIZE: D
SPEC.NO. 06-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-9



GRAPHIC SCALE

30' 0 30'

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

REFER TO DRAWING E-9 FOR GENERAL AND KEY NOTES APPLICABLE TO THIS DRAWING

N:\NAVY\KEYWEST\TRUMAN HARBOR\ELEC\E-10.DWG 03/14/03 13:58

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607
NO. 00006607

DRAWING REVISIONS

No.	Description	Prep'd By	Date	Approved

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

ELECTRICAL PLAN NORTH MOLE

ED FOR COMMERCIAL PURPOSES

APPROVED DATE

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE

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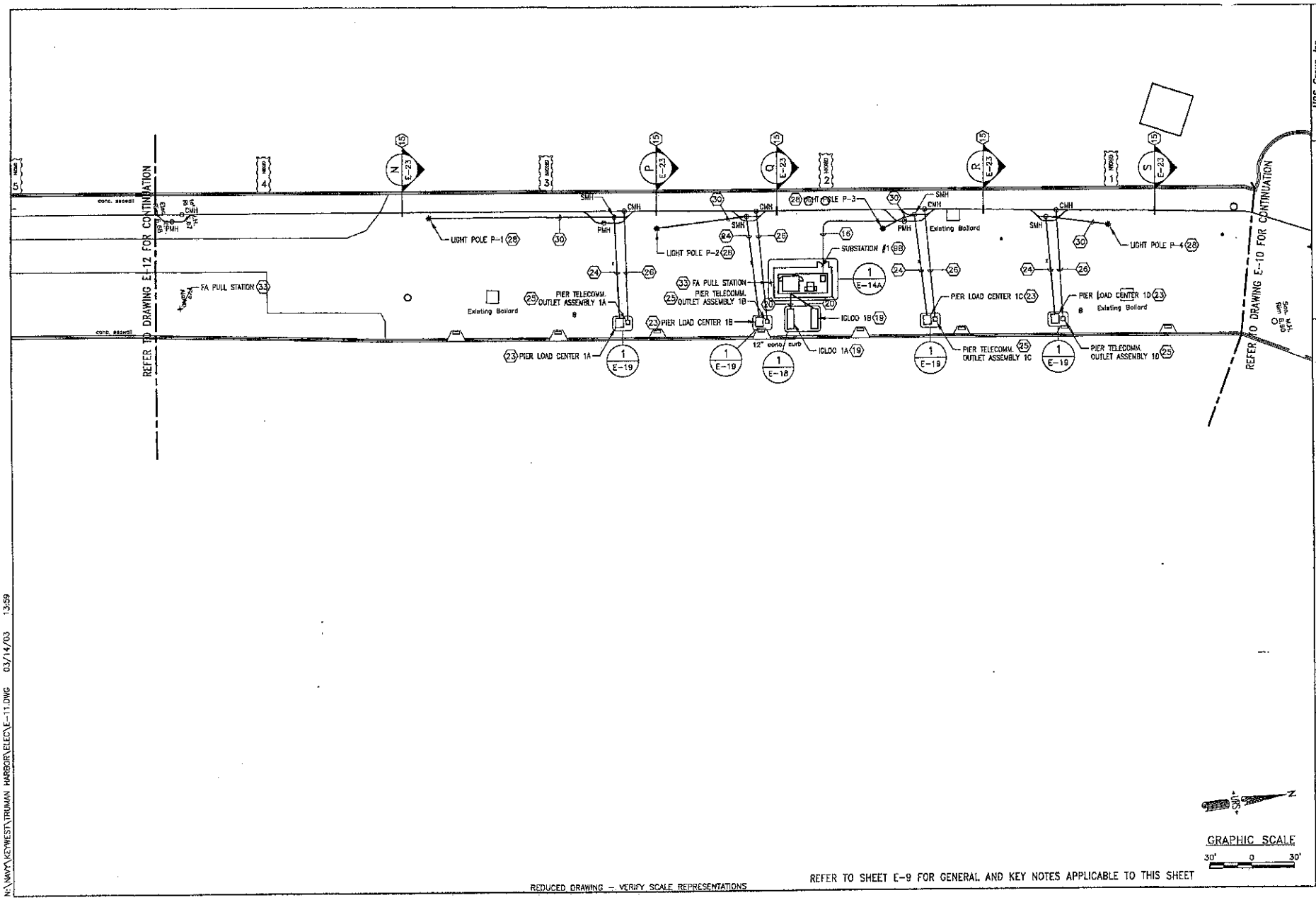
DRAWING SIZE: D
SPEC. NO. 06-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-10



GRAPHIC SCALE
30' 0 30'

REFER TO SHEET E-9 FOR GENERAL AND KEY NOTES APPLICABLE TO THIS SHEET

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

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URS Group, Inc.
7650 West Courtney Campbell Causeway, Suite 1100
Tampa, FL 33607-1462

DRAWING REVISIONS

No.	Description	Date	Appvd.

NAVAL AIR FACILITY
KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

ELECTRICAL PLAN CENTRAL MOLE

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTA
17 MARCH 2003

RECORD DRAWING DATA
CODE I.D. NO. 8999
DRAWING SIZE:
SPEC NO. 08-03-01
CONTRACT COMPLETION NO. N62467-03-C-01
NAVFAC DRAWING NO.

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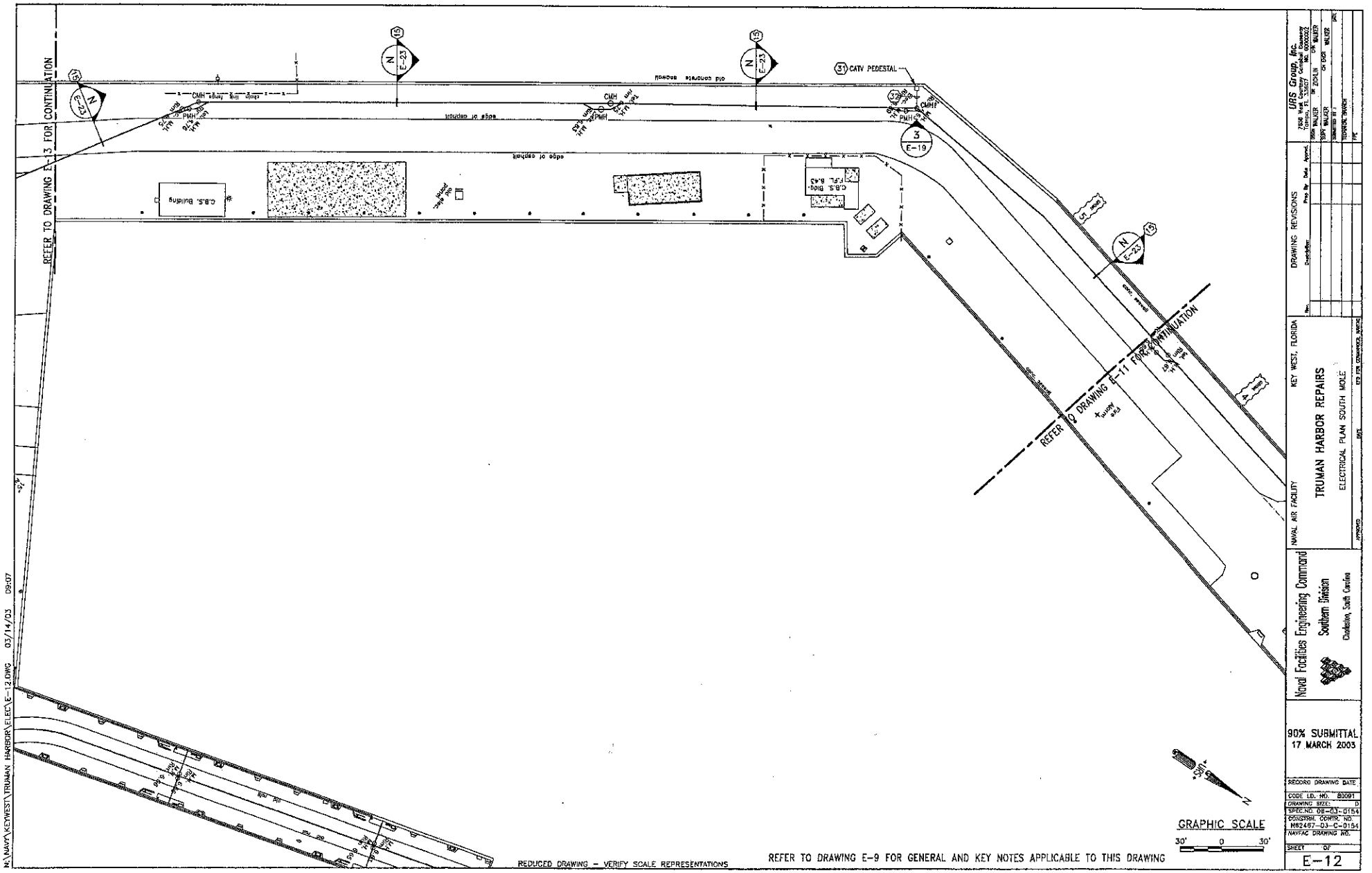

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URS Group, Inc.

DRAWING REVISIONS

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

ELECTRICAL PLAN SOUTH MOLE

Naval Facilities Engineering Command Southern Division Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE

CODE I.D. NO. 80091

DRAWING SIZE: D

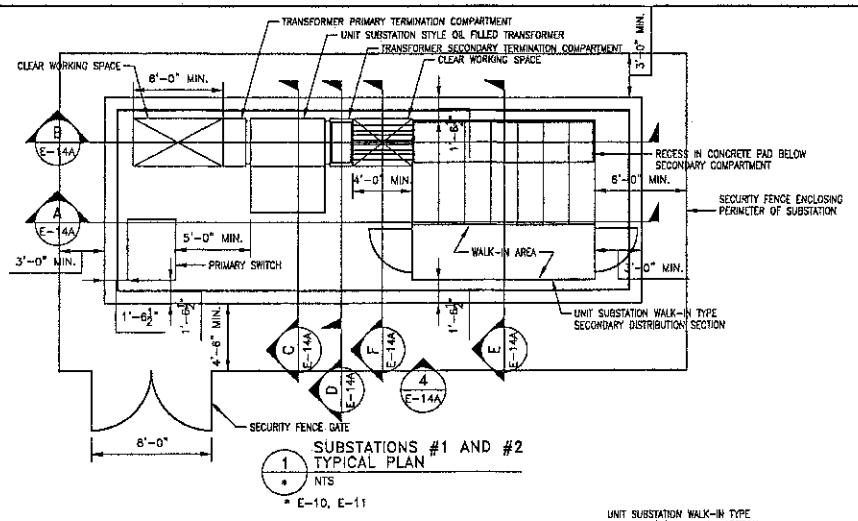
SPEC.NO. 08-03-0154

CONSTRN. CONTR. NO. N62467-03-C-0154

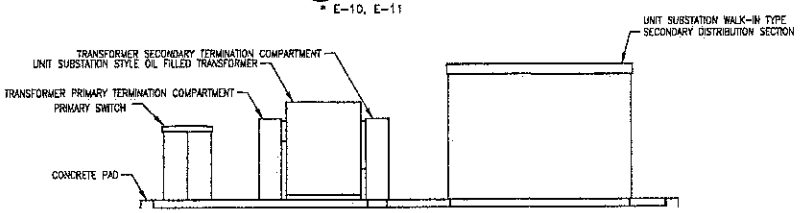
NAVFAC DRAWING NO.

SHEET OF

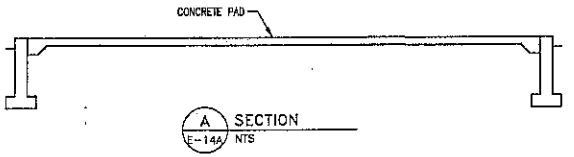
E-12



1 SUBSTATIONS #1 AND #2 TYPICAL PLAN
NTS
* E-10, E-11



4 E-14A ELEVATION NTS



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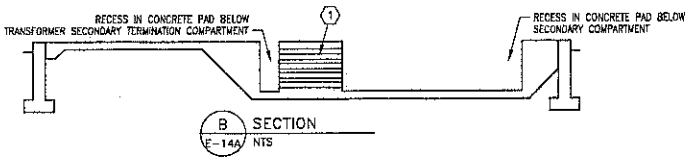

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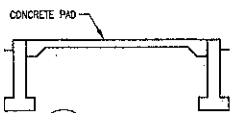

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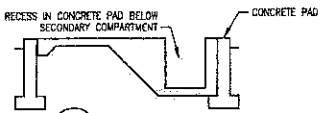

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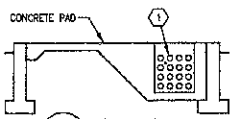

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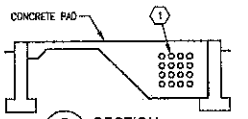

F E-14A SECTION NTS

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

KEY NOTES:

1. PROVIDE ONE 1" AND SIXTEEN 4" SCH. 40 PVC CONDUITS BETWEEN RECESSES. USE THE 1" CONDUIT TO ROUTE THE CURRENT TRANSFORMER WIRING BETWEEN THE CURRENT TRANSFORMERS MOUNTED ON THE SECONDARY BUSHINGS OF THE TRANSFORMER AND THE MAIN PROTECTIVE RELAY IN THE UNIT SUBSTATION SECONDARY DISTRIBUTION SECTION.

URS Group, Inc.
7650 West Courtney Campbell Causeway
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DRAWING REVISIONS

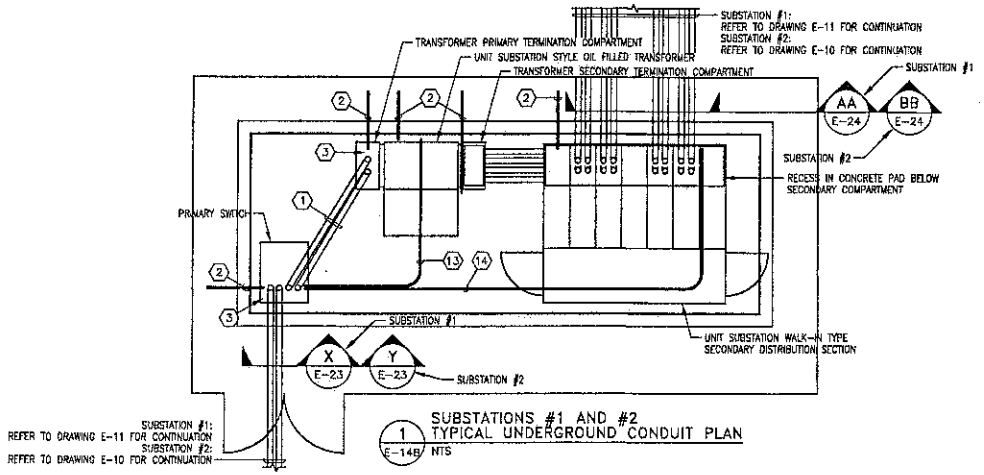
Rev.	Description	Prep. By	Date	Approved

NAVAL AIR FACILITY
KEY WEST, FLORIDA
TRUMAN HARBOR REPAIRS
SUBSTATIONS #1 AND #2 DETAILS – SHEET 1 OF 2

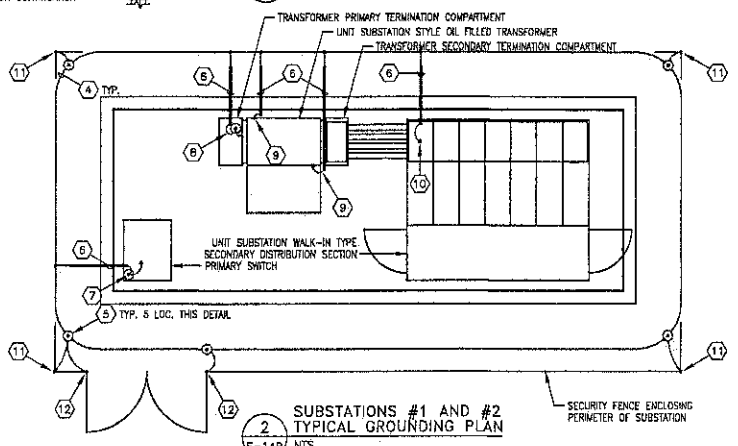
Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATA
CODE I.D. NO. 80091
DRAWING SIZE:
SPEC.NO. 06-03-015
CONSTRN. CONTR. NO. N62467-03-C-015
NAVFAC DRAWING NO.
SHEET OF
E-14A



1 SUBSTATIONS #1 AND #2 TYPICAL UNDERGROUND CONDUIT PLAN
E-14B NTS



2 SUBSTATIONS #1 AND #2 TYPICAL GROUNDING PLAN
E-14B NTS

GENERAL NOTES:

1. CUT OFF AND BUSH CONDUITS STUBBED UP UNDER PAD MOUNT EQUIPMENT 3" ABOVE CONCRETE PAD. SEAL VOIDS AROUND CONDUIT PENETRATIONS THROUGH CONCRETE PAD WITH WATER- AND OIL-RESISTANT CAULKING OR SEALANT.
2. GROUND PAD MOUNT EQUIPMENT IN ACCORDANCE WITH NFPA 70 AND IEEE C2. ALL GROUNDING MATERIALS SHALL COMPLY WITH UL 467.
3. PROVIDE HEAVY DUTY INDUSTRIAL, CORROSION-RESISTANT PAD LOCKS FOR ALL PAD AND RACK MOUNT EQUIPMENT OR ENCLOSURE DOORS HAVING PROVISIONS FOR PAD LOCKING. PAD LOCKS SHALL BE NOMINAL 2¾" WIDE LAMINATED STEEL BODY WITH HARDENED BORON ALLOY SHACKLE, REMOVABLE/REPLACEABLE 5-SPOOL PIN TUMBLER CYLINDER, BALL BEARING LOCKING MECHANISM, WITH PLASTIC CYLINDER COVER. ALL PAD LOCKS PROVIDED AS PART OF THIS PROJECT SHALL BE KEYED ALIKE.

KEY NOTES:

(1) PROVIDE TWO 4" SCH. 40 PVC CONDUITS FOR PRIMARY FEEDER TO TRANSFORMER, ONE ACTIVE AND ONE SPARE.

(2) PROVIDE 1" SCH. 40 PVC CONDUIT DIRECT BURIED WITH A MINIMUM OF 24" EARTH COVER, STUBBED OUT 24" BEYOND CONCRETE PAD. USE THIS CONDUIT TO ROUTE GROUNDING CONDUCTOR BETWEEN GROUNDING ELECTRODE CONDUCTOR LOOP AND PAD MOUNT EQUIPMENT.

(3) PROVIDE 1½" SCH. 40 PVC CONDUIT SLEEVE IN CONCRETE PAD. USE SLEEVE TO INSTALL GROUND ROD.

(4) PROVIDE ¾ BARE STRANDED COPPER GROUNDING ELECTRODE CONDUCTOR LOOP DIRECT BURIED WITH 24" EARTH COVER AND LOCATED 30" OUTSIDE PERIMETER OF CONCRETE PAD.

(5) PROVIDE GROUND ROD. DRIVE GROUND ROD UNTIL ITS TOP IS 6" BELOW FINAL GRADE.

(6) PROVIDE ⅜ BARE STRANDED COPPER GROUNDING CONDUCTOR IN CONDUIT UP TO PAD MOUNT EQUIPMENT.

(7) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 6" ABOVE TOP OF CONCRETE PAD. PROVIDE ⅜ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN PRIMARY SWITCH GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(8) PROVIDE GROUND ROD THROUGH SLEELE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ⅜ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN TRANSFORMER TANK PRIMARY COMPARTMENT GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(9) BOND GROUNDING CONDUCTOR TO TRANSFORMER GROUND PAD.

(10) BOND GROUNDING CONDUCTOR TO UNIT SUBSTATION GROUND BUS.

(11) PROVIDE #6 BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN FENCE CORNER POST AND GROUND ROD. BOND GROUNDING CONDUCTOR TO GROUND ROD.

(12) PROVIDE #4 BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN FENCE GATE POST AND GROUND ROD. BOND GROUNDING CONDUCTOR TO GROUND ROD. PROVIDE FLEXIBLE BRAIDED COPPER BONDING JUMPER BETWEEN GATE SECTION AND GATE POST.

(13) PROVIDE 1" PVC COATED RGS CONDUIT EMPTY, FOR FUTURE CONTROLS. STUB CONDUIT UP 3" ABOVE CONCRETE PAD ADJACENT TO TRANSFORMER CONTROLS AREA AND CAP. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN PRIMARY SWITCH TERMINATION COMPARTMENT.

(14) PROVIDE 1" PVC COATED RGS CONDUIT EMPTY, FOR FUTURE 120V AC POWER FOR CONTROLS. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN RECESS BELOW SECONDARY COMPARTMENT. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN PRIMARY SWITCH TERMINATION COMPARTMENT.

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607
NO. 00000022
DESIGNED: REILLY
DRAWN: GMG
CHECKED: REILLY
SUBMITTED BY: GARY WALKER
DATE: 03/17/03
TECHNICAL BRANCH: PPC

DRAWING REVISIONS

Dsn.	Description	Prep. By	Date	Apprvd.

KEY WEST, FLORIDA
NAVAL AIR FACILITY
TRUMAN HARBOR REPAIRS
SUBSTATIONS #1 AND #2 DETAILS - SHEET 2 OF 2
DATE
DO NOT SCALE DRAWING
APPROVED

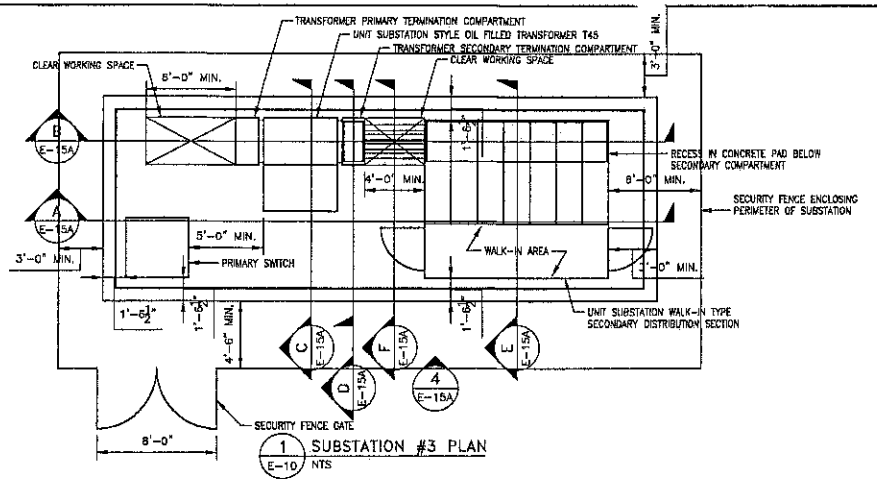
Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

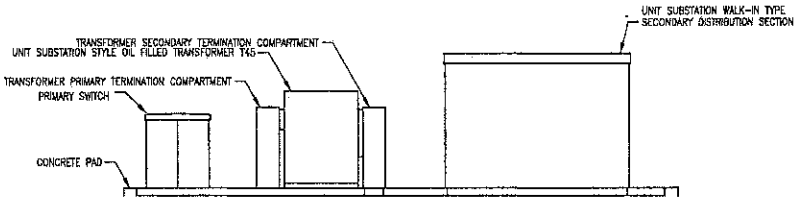
RECORD DRAWING DATE

CODE I.D. NO.	80091
DRAWING SIZE	D
SPEC.NO.	06-03-0154
CONSTRN. CONTR. NO.	N62467-03-C-0154
NAVFAC DRAWING NO.	
SHEET	OF
	E-14B

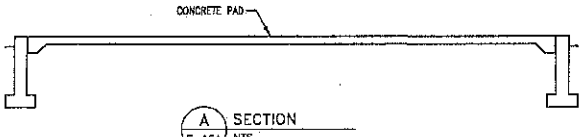
REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS



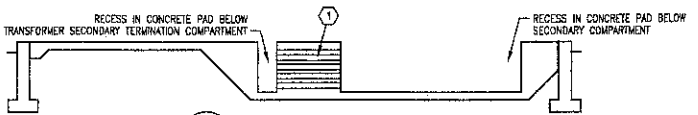
1 E-10 SUBSTATION #3 PLAN NTS



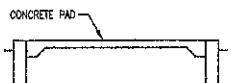
4 E-15A ELEVATION NTS



A E-15A SECTION NTS



B E-15A SECTION NTS



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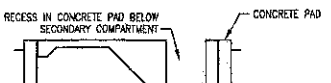
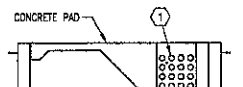
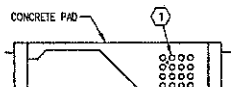


D E-15A SECTION NTS



E E-15A SECTION NTS



F E-15A SECTION NTS

KEY NOTES:

1. PROVIDE ONE 1" AND SIXTEEN 4" SCH. 40 PVC CONDUITS BETWEEN RECESSES. USE THE 1" CONDUIT TO ROUTE THE CURRENT TRANSFORMER WIRING BETWEEN THE CURRENT TRANSFORMERS MOUNTED ON THE SECONDARY BUSHINGS OF THE TRANSFORMER AND THE MAIN PROTECTIVE RELAY IN THE UNIT SUBSTATION SECONDARY DISTRIBUTION SECTION.

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607
NO. 0000000

DRAWING REVISIONS

Rev.	Description	Prep. by	Date	Appvd.

DSN. BOYLE
DRN. SAM WALKER
CHK. RORAY
SUBMITTED BY: SAM WALKER
SUPV. DR. RON WALKER
DATE
TYPE

KEY WEST, FLORIDA
NAVAL AIR FACILITY

TRUMAN HARBOR REPAIRS

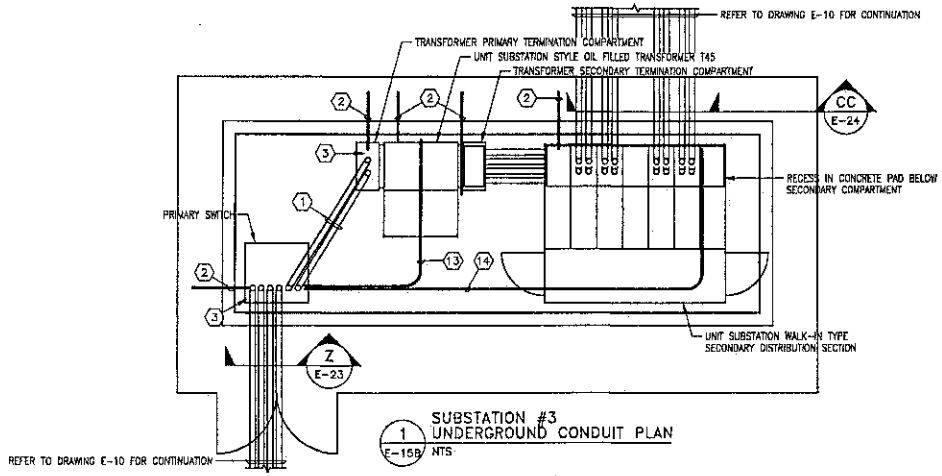
SUBSTATION #3 DETAILS – SHEET 1 OF 2

DATE
BTS FOR COMMANDER, NAVFAC
APPROVED

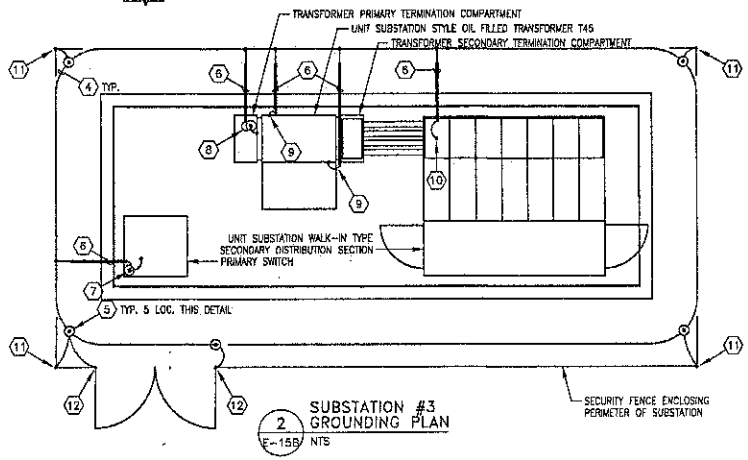
Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE
CODE I.D. NO. 80091
DRAWING SIZE: D
SPEC.NO. 06-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-15A



1 SUBSTATION #3 UNDERGROUND CONDUIT PLAN
E-15B NTS



2 SUBSTATION #3 GROUNDING PLAN
E-15B NTS

GENERAL NOTES:

1. CUT OFF AND BUSH CONDUITS STUBBED UP UNDER PAD MOUNT EQUIPMENT 3" ABOVE CONCRETE PAD. SEAL VOIDS AROUND CONDUIT PENETRATIONS THROUGH CONCRETE PAD WITH WATER- AND OIL-RESISTANT CAULKING OR SEALANT.
2. GROUND PAD MOUNT EQUIPMENT IN ACCORDANCE WITH NFPA 70 AND IEEE C2. ALL GROUNDING MATERIALS SHALL COMPLY WITH UL 467.
3. PROVIDE HEAVY DUTY INDUSTRIAL CORROSION-RESISTANT PAD LOCKS FOR ALL PAD AND RACK MOUNT EQUIPMENT OR ENCLOSURE DOORS HAVING PROVISIONS FOR PAD LOCKING. PAD LOCKS SHALL BE NOMINAL 2⅛" WIDE LAMINATED STEEL BODY WITH HARDENED BORON ALLOY SHACKLE, REMOVABLE/REPLACEABLE 5-SPOOL PIN TUMBLER CYLINDER, BALL BEARING LOCKING MECHANISM, WITH PLASTIC CYLINDER COVER. ALL PAD LOCKS PROVIDED AS PART OF THIS PROJECT SHALL BE KEYED ALIKE.

KEY NOTES:

(1) PROVIDE TWO 4" SCH. 40 PVC CONDUITS FOR PRIMARY FEEDER TO TRANSFORMER, ONE ACTIVE AND ONE SPARE.

(2) PROVIDE 1" SCH. 40 PVC CONDUIT DIRECT BURIED WITH A MINIMUM OF 24" EARTH COVER, STUBBED OUT 24" BEYOND CONCRETE PAD. USE THIS CONDUIT TO ROUTE GROUNDING CONDUCTOR BETWEEN GROUNDING ELECTRODE CONDUCTOR LOOP AND PAD MOUNT EQUIPMENT.

(3) PROVIDE 1½" SCH. 40 PVC CONDUIT SLEEVE IN CONCRETE PAD. USE SLEEVE TO INSTALL GROUND ROD.

(4) PROVIDE ½ BARE STRANDED COPPER GROUNDING ELECTRODE CONDUCTOR LOOP DIRECT BURIED WITH 24" EARTH COVER AND LOCATED 30" OUTSIDE PERIMETER OF CONCRETE PAD.

(5) PROVIDE GROUND ROD. DRIVE GROUND ROD UNTIL ITS TOP IS 6" BELOW FINAL GRADE.

(6) PROVIDE ½ BARE STRANDED COPPER GROUNDING CONDUCTOR IN CONDUIT UP TO PAD MOUNT EQUIPMENT.

(7) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ½ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN PRIMARY SWITCH GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(8) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ½ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN TRANSFORMER TANK PRIMARY COMPARTMENT GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(9) BOND GROUNDING CONDUCTOR TO TRANSFORMER GROUND PAD.

(10) BOND GROUNDING CONDUCTOR TO UNIT SUBSTATION GROUND BUS.

(11) PROVIDE #4 BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN FENCE CORNER POST AND GROUND ROD. BOND GROUNDING CONDUCTOR TO GROUND ROD.

(12) PROVIDE #4 BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN FENCE GATE POST AND GROUND ROD. BOND GROUNDING CONDUCTOR TO GROUND ROD. PROVIDE FLEXIBLE BRAIDED COPPER BONDING JUMPER BETWEEN GATE SECTION AND GATE POST.

(13) PROVIDE 1" PVC COATED RGS CONDUIT EMPTY, FOR-FUTURE CONTROLS. STUB CONDUIT UP 3" ABOVE CONCRETE PAD ADJACENT TO TRANSFORMER CONTROLS AREA AND CAP. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN PRIMARY SWITCH TERMINATION COMPARTMENT.

(14) PROVIDE 1" PVC COATED RGS CONDUIT EMPTY, FOR FUTURE 120V AC POWER FOR CONTROLS. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN RECESS BELOW SECONDARY COMPARTMENT. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN PRIMARY SWITCH TERMINATION COMPARTMENT.

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462
(813) 286-1711

DRAWING REVISIONS

No.	Description	Prep. By	Date	Approved
	ISSUED FOR BID	DAN HENLEY	03/17/03	STEVE WALKER

NAVAL AIR FACILITY
KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

SUBSTATION #3 DETAILS - SHEET 2 OF 2

DO NOT SCALE DRAWING

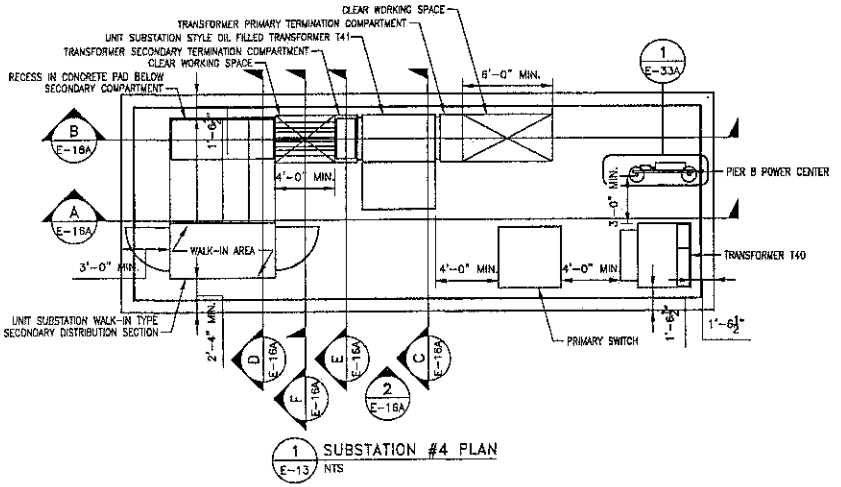
APPROVED

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE:
CODE I.D. NO. 80091
DRAWING SIZE: D
SPEC.NO. 06-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-15B

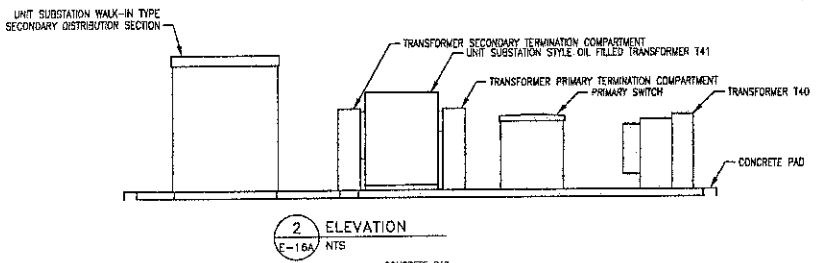
REDUCED DRAWING -- VERIFY SCALE REPRESENTATIONS



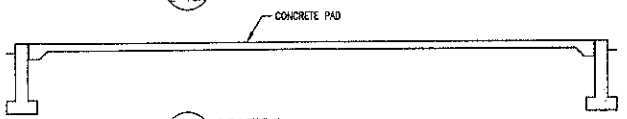
1 E-13 SUBSTATION #4 PLAN NTS

KEY NOTES:

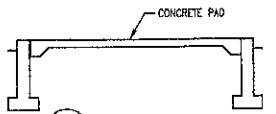
(1) PROVIDE ONE 1" AND SIXTEEN 4" SCH. 40 PVC CONDUITS BETWEEN RECESSES AS SPECIFIED. USE THE 1" CONDUIT TO ROUTE THE CURRENT TRANSFORMER WIRING BETWEEN THE CURRENT TRANSFORMERS MOUNTED ON THE SECONDARY BUSHINGS OF THE TRANSFORMER AND THE MAIN PROTECTIVE RELAY IN THE UNIT SUBSTATION SECONDARY DISTRIBUTION SECTION.



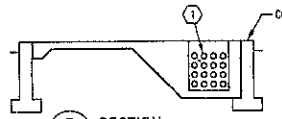
2 E-16A ELEVATION NTS



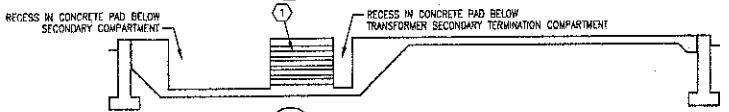
A E-16A SECTION NTS



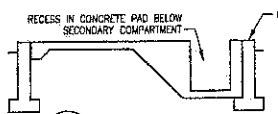
C E-16A SECTION NTS



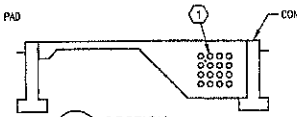
E E-16A SECTION NTS



B E-16A SECTION NTS



D E-16A SECTION NTS



F E-16A SECTION NTS

REDUCED DRAWING – VERIFY SCALE REPRESENTATIONS

URS Group, Inc. 7650 W. Courtney Campbell Causeway Tampa, FL 33607 TEL. 0000000 FAX. 0000000

DRAWING REVISIONS

Rev.	Description	Prep. by	Date	Appvd.

DSN KEELY | DR KEELY | CH RYAN WALKER | SUBMITTED BY: | REVIEWED BRYAN

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

SUBSTATION #4 DETAILS – SHEET 1 OF 2

Naval Facilities Engineering Command Southern Division Charleston, South Carolina

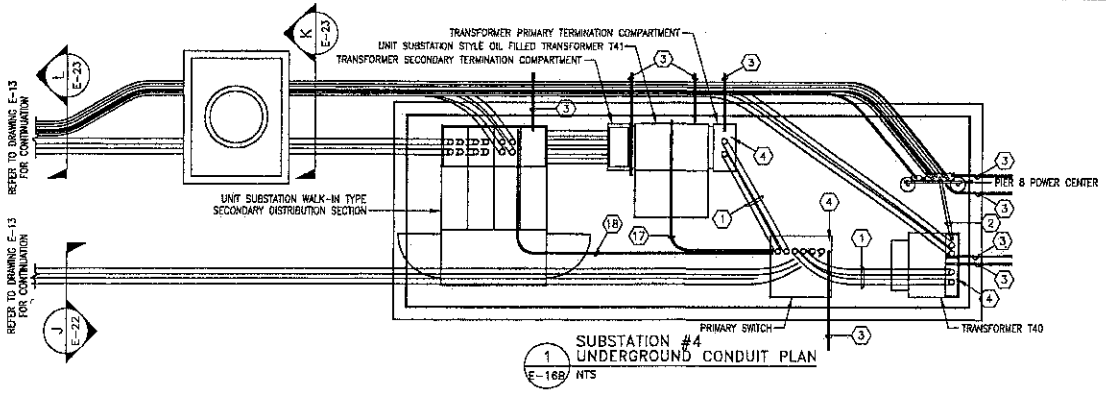
90% SUBMITTA
17 MARCH 200

RECORD DRAWING DA

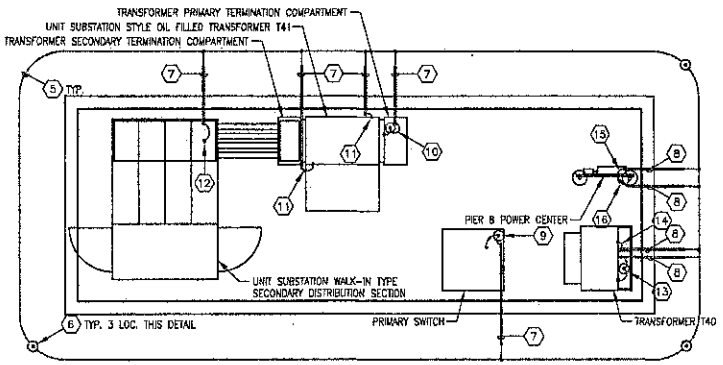
CODE I.D. NO. 8000
DRAWING SIZE:
SPEC./NO. 06-03-0
CONSTRN. CONTR. NO
N62467-03-C-0
NAVFAC DRAWING NO.

SHEET OF

E-16A



1 SUBSTATION #4 UNDERGROUND CONDUIT PLAN
E-16B NTS



2 SUBSTATION #4 GROUNDING PLAN
E-16B NTS

GENERAL NOTES:

1. CUT OFF AND BUSH CONDUITS STUBBED UP UNDER PAD MOUNT EQUIPMENT 3" ABOVE CONCRETE PAD. SEAL VOIDS AROUND CONDUIT PENETRATIONS THROUGH CONCRETE PAD WITH WATER- AND OIL-RESISTANT CAULKING OR SEALANT.
2. GROUND PAD MOUNT EQUIPMENT IN ACCORDANCE WITH NFPA 70 AND IEEE C2. ALL GROUNDING MATERIALS SHALL COMPLY WITH UL 467.
3. PROVIDE HEAVY DUTY INDUSTRIAL CORROSION-RESISTANT PAD LOCKS FOR ALL PAD AND RACK MOUNT EQUIPMENT OR ENCLOSURE DOORS HAVING PROVISIONS FOR PAD LOCKING. PAD LOCKS SHALL BE NOMINAL 2⅝" WIDE LAMINATED STEEL BODY WITH HARDENED BORON ALLOY SHACKLE, REMOVABLE/REPLACEABLE 6-SPOOL PIN TUMBLER CYLINDER, BALL BEARING LOCKING MECHANISM, WITH PLASTIC CYLINDER COVER. ALL PAD LOCKS PROVIDED AS PART OF THIS PROJECT SHALL BE KEYED ALIKE.

KEY NOTES:

(1) PROVIDE TWO 4" SCH. 40 PVC CONDUITS FOR PRIMARY FEEDER TO TRANSFORMER, ONE ACTIVE AND ONE SPARE.

(2) PROVIDE 2" SCH. 40 PVC CONDUIT FOR FEEDER TO PIER 8 POWER CENTER PANELBOARD.

(3) PROVIDE 1" SCH. 40 PVC CONDUIT DIRECT BURIED WITH A MINIMUM OF 24" EARTH COVER, STUBBED OUT 24" BEYOND CONCRETE PAD. USE THIS CONDUIT TO ROUTE GROUNDING CONDUCTOR BETWEEN GROUNDING ELECTRODE CONDUCTOR LOOP AND PAD MOUNT EQUIPMENT.

(4) PROVIDE 1½" SCH. 40 PVC CONDUIT SLEEVE IN CONCRETE PAD. USE SLEEVE TO INSTALL GROUND ROD.

(5) PROVIDE ⅝ BARE STRANDED COPPER GROUNDING ELECTRODE CONDUCTOR LOOP DIRECT BURIED WITH 24" EARTH COVER AND LOCATED 30" OUTSIDE PERIMETER OF CONCRETE PAD.

(6) PROVIDE GROUND ROD. DRIVE GROUND ROD UNTIL ITS TOP IS 6" BELOW FINAL GRADE.

(7) PROVIDE ⅝ BARE STRANDED COPPER GROUNDING CONDUCTOR IN CONDUIT UP TO PAD MOUNT EQUIPMENT.

(8) PROVIDE ¼ BARE STRANDED COPPER GROUNDING CONDUCTOR IN CONDUIT UP TO PAD MOUNT EQUIPMENT.

(9) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ⅝ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN PRIMARY SWITCH GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(10) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. BOND GROUNDING CONDUCTOR AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(11) BOND GROUNDING CONDUCTOR TO TRANSFORMER GROUND PAD.

(12) BOND GROUNDING CONDUCTOR TO UNIT SUBSTATION GROUND BUS.

(13) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ⅝ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN TRANSFORMER TANK PRIMARY COMPARTMENT GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

(14) BOND GROUNDING CONDUCTOR TO TRANSFORMER TANK SECONDARY COMPARTMENT GROUND LUG.

(15) BOND GROUNDING CONDUCTOR TO PIER 8 POWER CENTER PANELBOARD GROUND BUS.

(16) BOND GROUNDING CONDUCTOR TO PIER 8 POWER CENTER MOUNTING RACK STRUCTURAL STEEL SUPPORT POST.

(17) PROVIDE 1" PVC COATED RGS CONDUIT EMPTY, FOR FUTURE CONTROLS. STUB CONDUIT UP 3" ABOVE CONCRETE PAD ADJACENT TO TRANSFORMER CONTROLS AREA AND CAP. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN PRIMARY SWITCH TERMINATION COMPARTMENT.

(18) PROVIDE 1" PVC COATED RGS CONDUIT EMPTY, FOR FUTURE 120V AC POWER FOR CONTROLS. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN RECESS BELOW SECONDARY COMPARTMENT. STUB CONDUIT UP 3" ABOVE CONCRETE PAD IN PRIMARY SWITCH TERMINATION COMPARTMENT.

URS Group, Inc.
7650 West Courtney Campbell Causeway
Tampa, Florida 33607

DRAWING REVISIONS

Rev.	Description	Prep By	Date	Approved

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

SUBSTATION #4 DETAILS - SHEET 2 OF 2

APPROVED DATE

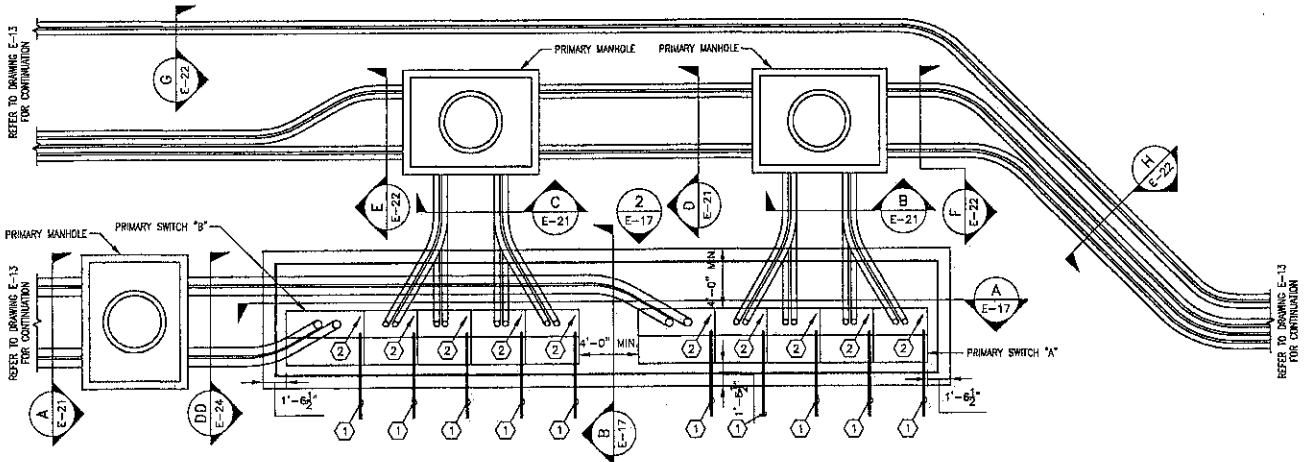
Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE

CODE I.D. NO. 20097
DRAWING SIZE: D
SPEC NO. 06-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-16B

REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS



1 E-13 PRIMARY SWITCHES "A" AND "B" PLAN NTS

GENERAL NOTES:

1. CUT OFF AND BUSH CONDUITS STUBBED UP UNDER PAD MOUNT EQUIPMENT 3" ABOVE CONCRETE PAD. SEAL VOIDS AROUND CONDUIT PENETRATIONS THROUGH CONCRETE PAD WITH WATER- AND OIL-RESISTANT CAULKING OR SEALANT.
2. GROUND PAD MOUNT EQUIPMENT IN ACCORDANCE WITH NFPA 70 AND IEEE C2. ALL GROUNDING MATERIALS SHALL COMPLY WITH UL 467.
3. PROVIDE HEAVY DUTY INDUSTRIAL CORROSION-RESISTANT PAD LOCKS FOR ALL PAD AND RACK MOUNT EQUIPMENT OR ENCLOSURE DOORS HAVING PROVISIONS FOR PAD LOCKING. PAD LOCKS SHALL BE NOMINAL 2⅞" WIDE LAMINATED STEEL BODY WITH HARDENED BORON ALLOY SHACKLE, REMOVABLE/REPLACEABLE 5-SPOOL PIN TUMBLER CYLINDER, BALL BEARING LOCKING MECHANISM, WITH PLASTIC CYLINDER COVER. ALL PAD LOCKS PROVIDED AS PART OF THIS PROJECT SHALL BE KEYED ALIKE.

KEY NOTES:

(1) PROVIDE 1" SCH. 40 PVC CONDUIT DIRECT BURIED WITH A MINIMUM OF 24" EARTH COVER, STUBBED OUT 24" BEYOND CONCRETE PAD. USE THIS CONDUIT TO ROUTE GROUNDING CONDUCTOR BETWEEN GROUNDING ELECTRODE CONDUCTOR LOOP AND PAD MOUNT EQUIPMENT.

(2) PROVIDE 1½" SCH. 40 PVC CONDUIT SLEEVE IN CONCRETE PAD. USE SLEEVE TO INSTALL GROUND ROD.

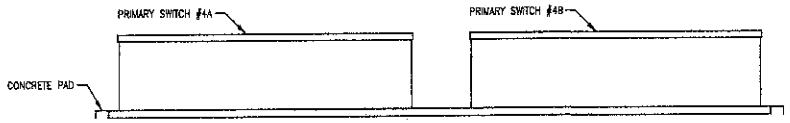
(3) PROVIDE ⅜ BARE STRANDED COPPER GROUNDING ELECTRODE CONDUCTOR LOOP DIRECT BURIED WITH 24" EARTH COVER AND LOCATED 30" OUTSIDE PERIMETER OF CONCRETE PAD.

(4) PROVIDE GROUND ROD. DRIVE GROUND ROD UNTIL ITS TOP IS 6" BELOW FINAL GRADE.

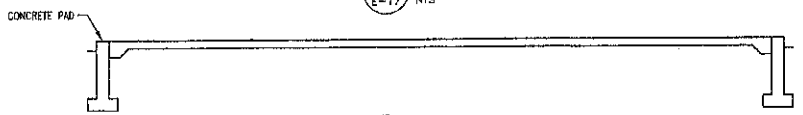
(5) PROVIDE ⅜ BARE STRANDED COPPER GROUNDING CONDUCTOR IN CONDUIT UP TO PAD MOUNT EQUIPMENT.

(6) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ⅜ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN SWITCHED WAY COMPARTMENT GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.

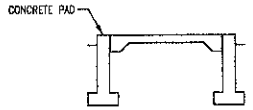
(7) PROVIDE GROUND ROD THROUGH SLEEVE. DRIVE GROUND ROD UNTIL ITS TOP PROJECTS 8" ABOVE TOP OF CONCRETE PAD. PROVIDE ⅜ BARE STRANDED COPPER GROUNDING CONDUCTOR BETWEEN PROTECTED WAY COMPARTMENT GROUND LUG AND GROUND ROD. BOND GROUNDING CONDUCTORS AND PRIMARY CABLE TERMINATION SHIELDS TO GROUND ROD.



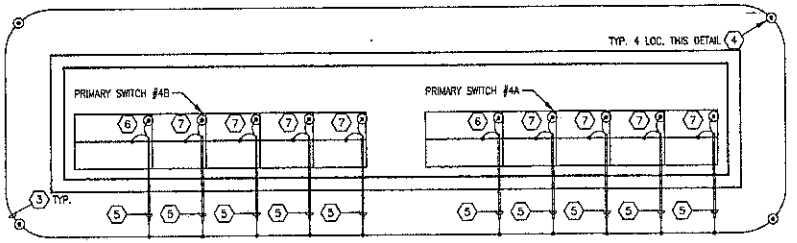
2 E-17 ELEVATION NTS



A E-17 SECTION NTS



B E-17 SECTION NTS



3 E-17 PRIMARY SWITCHES "A" AND "B" GROUNDING PLAN NTS

REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS

URS Group, Inc. 7650 West Courtney Campbell Causeway Tampa, FL 33607 NO. 00000002

DRAWING REVISIONS

No.	Description	Prep. By	Date	Apprvd.

NAVAL AIR FACILITY KEY WEST, FLORIDA

TRUMAN HARBOR REPAIRS

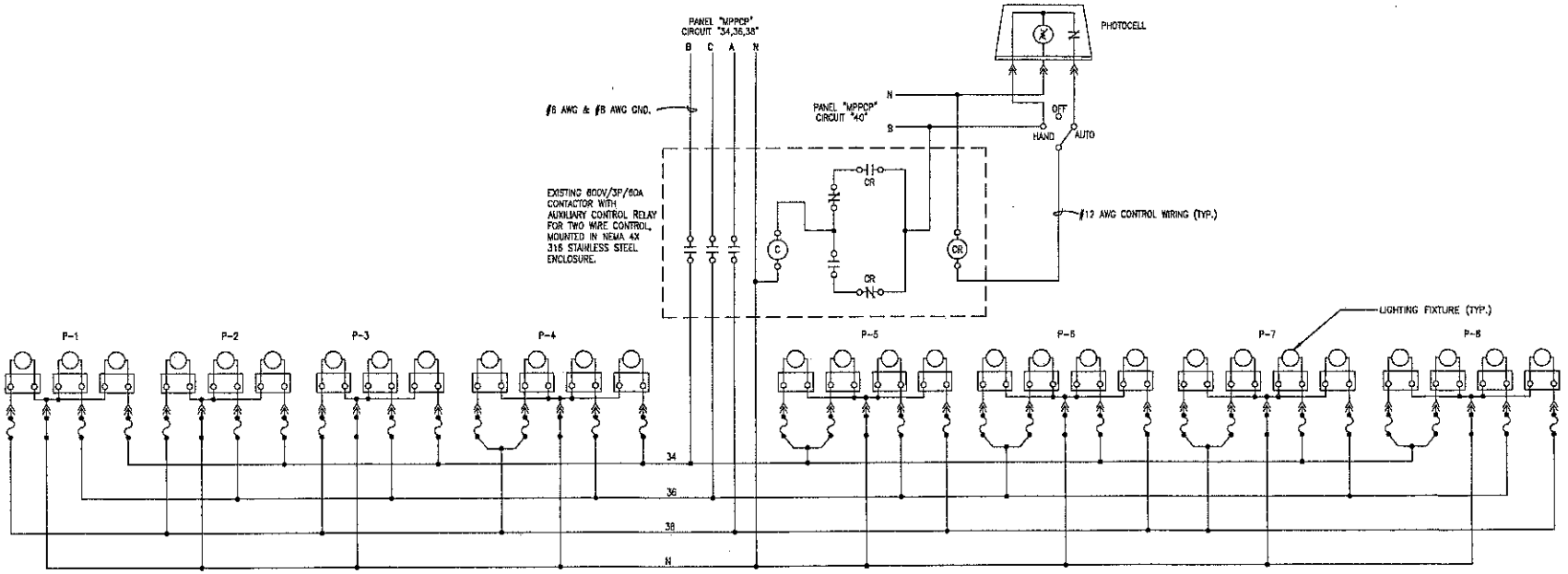
PRIMARY SWITCHES "A" AND "B" DETAILS

Naval Facilities Engineering Command Southern Division Charleston, South Carolina

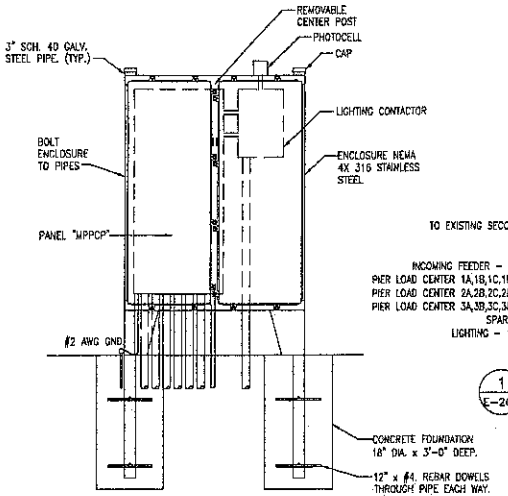
90% SUBMITTA
17 MARCH 200

RECORD DRAWING DA
CODE I.D. NO. 800
DRAWING SIZE:
SPEC.NO. 08-03-01
CONSTRN. CONTR. N
N02467-03-C-01
NAVFAC DRAWING NO

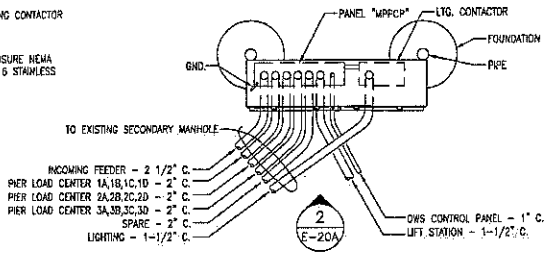
SHEET OF
E-17



3 SCHEMATIC WIRING DIAGRAM
E-20A NTS



2 DISTRIBUTION PANEL ENCLOSURE
E-20A NTS



1 DISTRIBUTION PANEL ENCLOSURE - PLAN
E-20A NTS

NAME: PANEL"MPPCP" VOLTAGE: 480/277V PHASE: 3 WIRE: 4
BUS RATING: 225A MAIN BKR RATING: 225A MIN. kAIC RATING: 14kAIC
LOCATION: ADJACENT TO TRANSFORMER "T43" MOUNTING: SURFACE FED FROM: TRANSFORMER "T43"

CKT NO.	CIRCUIT DESCRIPTION	LOAD (kVA)	BKR AMPS	PH	BKR AMPS	LOAD (kVA)	CIRCUIT DESCRIPTION	CKT NO.
1	PIER LOAD CENTER 1A	0.36	25	A	25	0.36	PIER LOAD CENTER 2A	2
3		0.36		B		0.36		4
5	PIER LOAD CENTER 1B	0.36	25	C	25	0.36	PIER LOAD CENTER 2B	6
7		0.36		A		0.36		8
9	PIER LOAD CENTER 1C	0.36	25	B	25	0.36	PIER LOAD CENTER 2C	10
11		0.36		C		0.36		12
13	PIER LOAD CENTER 1D	0.36	25	A	25	0.36	PIER LOAD CENTER 2D	14
15		0.36		B		0.36		16
17	SPARE		25	C	25	0.36	PIER LOAD CENTER 3A	18
19				A		0.36		20
21	SPARE		25	B	25	0.36	PIER LOAD CENTER 3B	22
23				C		0.36		24
25	SPARE		20	A	25	0.36	PIER LOAD CENTER 3C	26
27				B		0.36		28
29				C		0.36	PIER LOAD CENTER 3D	30
31	LIFT STATION CONTROL PANEL	7.48	70	A	25	0.36		32
33		7.48		B		12.49	LIGHTING CONTACTOR	34
35		7.48		C	60	11.25		36
37	SPARE		60	A		12.49		38
39				B	20	0.10	LIGHTING CONTROL	40
41				C	20	0.10	MOLE DWS CONTROL PANEL	42

	A	B	C	TOTAL
CONNECTED LOAD (PER PHASE kVA):	23.21	22.85	21.36	67.51
CONNECTED LOAD (PER PHASE AMPS):	83.8	82.9	77.1	

FEATURES: NEMA TYPE 4X 316 STAINLESS STEEL ENCLOSURE.

REDUCED DRAWING - VERIFY SCALE REPRESENTATIONS

URS Group, Inc. 7650 West Courtney Campbell Causeway Tampa, FL 33607 (813) 286-1711

DRAWING REVISIONS

No.	Description	Prep. By	Date	Appvd.

DSN. DRF KELLY CHK. DR KELLY APVD. DR KELLY
DRN. JEFF WALKER CHK. DR KELLY APVD. WALKER
SUBMITTED BY: DISPATCH DATE:
FILE

KEY WEST, FLORIDA
NAVAL AIR FACILITY
TRUMAN HARBOR REPAIRS
MOLE LIGHTING AND RELATED DETAILS - SHEET 1 OF 2
APPROVED DATE
AS-BUILT DRAWINGS MARKED

Naval Facilities Engineering Command
Southern Division
Charleston, South Carolina

90% SUBMITTAL
17 MARCH 2003

RECORD DRAWING DATE
CODE I.D. NO. 80091
DRAWING SIZE D
SPEC.NO. 08-03-0154
CONSTRN. CONTR. NO. N62467-03-C-0154
NAVFAC DRAWING NO.
SHEET OF
E-20A

Exhibit B

FIELD REPORT DATED FEBRUARY 2012

Report on Mole Pier Vacuum switches
FEBRUARY 2012

After an equipment visual inspection, we found the following equipment/materials deficiencies on Mole Pier, Key West.

Vacuum Switch for Switchgear #1

Condition of Vacuum Switch

1. High voltage cables insulation has salt buildup and evidence of tracking.
2. Ground wiring, switch tank and connections are showing signs of corrosion.
3. Vacuum switch seals are cracked and deteriorated.

Switchgear #1

Enclosure:

1. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
2. Cabinet heater for humidity control corroded and shorted out.
3. Overcurrent relays were in decent shape, most of them were recently replaced.
4. Most of the electronic controls are being exposed to the salt air corrosion and leading to failures of the safety devices installed on the breakers.

Breakers:

Breaker #1:

12 - Bad current transformers (housing cracked/broken)

Breaker #2:

10 - Bad current transformers (housing cracked/broken)

Breaker #3: Breaker Not in Place.

10 - Bad current transformers (housing cracked/broken)

1 Set of 750kcmil THHN cables from switchgear to shore power was removed.

Breaker #4:

10 - Bad current transformers (housing cracked/broken)

Vacuum Switch for Switchgear #2

Condition of Vacuum Switch

1. Ground wiring and connections are showing signs of corrosion.
2. Vacuum switch seals are cracked and deteriorated.
3. Gas meter gauge was indicating low levels of gas.

Switchgear #2

Enclosure:

1. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
2. Cabinet heater for humidity control corroded and shorted out.
3. Overcurrent relays were in decent shape, most of them were recently replaced.
4. Most of the electronic controls are being exposed to the salt air corrosion and leading to failures of the safety devices installed on the breakers.

Breakers:

Breaker #1:

12 - Bad current transformers (housing cracked/broken)

Breaker #2:

2 - Bad current transformers (housing cracked/broken)

Breaker #3:

6 - Bad current transformers (housing cracked/broken)
Cable connections are loose at SWGR connection point

Breaker #4:

7 - Bad current transformers (housing cracked/broken)

Vacuum Switch for Switchgear #4

Condition of Vacuum Switch

1. Ground wiring and connections are showing signs of corrosion.
2. Vacuum switch seals are cracked and deteriorated.

Switchgear #4

Enclosure:

1. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
2. Cabinet heater for humidity control corroded and shorted out.
3. Overcurrent relays were in decent shape, most of them were recently replaced.

Breakers:

Breaker #1:

7 - Bad current transformers (housing cracked/broken).
Broken 800A breaker.

Breaker #2:

7 - Bad current transformers (housing cracked/broken).
1 Set of 750kcmil THHN cables from switchgear to shore power were burned out and needs replacement.

Breaker #4:

1 Set of 750kcmil THHN cables from switchgear to shore power were burned out and needs replacement.

Switchgear #3 was not inspected at this moment due to cruises activity on the pier.
*It is expected to have mayor damage at this switchgear due to the location of the equipment.

NOTE:
A lot of maintenance effort has been provided already in order to keep the electrical equipment up and running against the weather environment from last condition reported back in 2011. Cleaning of equipments (switch gear and shore igloos), new CT's, new overcurrent devices, cable replacement/removal and changed breakers were part of the provided maintenance.

- The above equipment should be replaced/fix, in addition to any internal not operating equipment that was not detected at the moment of inspection and is not mentioned in this report.
- Existing cable is THHN. This type of cable is not designed to be in water continuously. This is leading to breakdowns in the insulation and causing the cables to short to ground. Existing THHN cables shall be replaced with **RHW** type insulation cables.

- In my opinion, all CT's should be replaced in order to ensure proper operation. Any "good" CT's can be kept as spare for future replacement.

Report on Mole Pier Vacuum switches

Main Vacuum Switches by gate to mole pier

1. Condition of Vacuum switch #1
   a. Door seals are worn and cracked allowing rain to enter the control area of the switch.
   b. Water leaking in from top and sides around joints
   c. High voltage cables insulation has salt buildup and evidence of tracking.
   d. Overcurrent relays on switches have deteriorated wiring harness leading to exposed wiring.
   e. Ground wiring and connections are showing signs of corrosion.

1. Condition of Vacuum switch #2
   a. Door seals are worn and cracked allowing rain to enter the control area of the switch.
   b. Water leaking in from top and sides around joints
   c. High voltage cables insulation has salt buildup and evidence of tracking.
   d. Overcurrent relays on switches have deteriorated wiring harness leading to exposed wiring.
   e. Ground wiring and connections are showing signs of corrosion.

Vacuum Switch for Switchgear #1

1. Condition of Vacuum switch enclosure
   a. Water leaking in from top and sides around joints
2. Condition of Vacuum Switch
   a. High voltage cables insulation has salt buildup and evidence of tracking.
   b. Overcurrent relays on switches have deteriorated wiring harness leading to exposed wiring.
   c. Ground wiring and connections are showing signs of corrosion

Switchgear #1

1. Condition of Enclosure
   a. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
   b. Cabinet heater for humidity control corroded and shorted out
   c. Water leaking in from roof and sides around joints

2. Breakers
   a. Breaker #1 Shore Power
      (1) 2 bad CT's (Current transformers) housing cracked
   c. Breaker #3 Shore Power
      (1) Control switch nonoperational
      (2) Output feeder cable to Shore power station damaged
      (3) Bolts and hardware rusted
      (4) 8 bad CT's (Current transformers) housing cracked
      (5) Connection plug between breaker and switchgear broken
      (6) Overcurrent Relay BE1-951 damaged due to salt corrosion-nonoperational
   d. Breaker #4 Shore Power
      (1) 2 bad CT's (Current transformers) housing cracked
      (2) Secondary connector plug broken. Needs replaced
      (3) Cables going to pier have grounds. Resistance to ground is less than 1000 ohms

3. Main Switchgear Transformer
   a. Low on Oil
   b. Rust on cooling Fins, vents, mounting bolts, and Ground connections

Switchgear #2

1. Condition of Enclosure
   a. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
   b. Cabinet heater for humidity control corroded and shorted out
   c. Water leaking in from roof and sides around joints
2. Breakers
   a. Breaker #1 Shore Power
      (1) Output feeder cable to Shore power station damaged
      (2) Secondary connector plug broken. Needs replaced
   b. Breaker #2 Shore Power
      (1) Output feeder cable to Shore power station damaged
      (2) 11 bad CT's (Current transformers) housing cracked
   c. Breaker #3 Shore Power
      (1) Output feeder cable to Shore power station damaged
3. Main Switchgear Transformer
   a. Rust on cooling Fins, vents, mounting bolts, and Ground connections
4. Condition of Vacuum switch supplying transformer
   a. Seals leaking
   b. High voltage cables insulation has salt buildup and evidence of tracking.

Switchgear #3

1. Condition of Enclosure
   a. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
   b. Cabinet heater for humidity control corroded and shorted out
   c. Rubber Insulation on Bus Bars is melting and exposing live bus
   d. Water leaking in from roof and sides around joints
2. Breakers
   a. Breaker #1 Shore Power--Repaired

   b. Breaker #2 Shore Power-Repaired

   c. Breaker #3 Shore Power--Repaired

   d. Breaker #4 Shore Power
      (1) Control switch nonoperational
      (2) Output feeder cable to Shore power station damaged
      (3) Bolts and hardware rusted

3. Main Breakers supplying Shore power Breakers
   a. Breaker #1
   b. Breaker #2
4. Main Switchgear Transformer
   a. Rust on cooling Fins, vents, mounting bolts, and Ground connections
5. Condition of Vacuum switch supplying transformer
   a. Seals leaking
   b. High voltage cables insulation has salt buildup and evidence of tracking.

Switchgear #4 Feeding Pier 8

1. Condition of Enclosure
   a. Door seals are worn and cracked allowing rain to enter the control area of the switchgear.
   b. Cabinet heater for humidity control corroded and shorted out
   c. Water leaking in from roof and sides around joints
2. Breakers
   a. Breaker #1 Shore Power
      (1) Output feeder cable to Shore power station damaged
      (2) Bolts and hardware rusted.
      (3) One set of cables to shore power station grounded and arcing to ground.
   b. Breaker #2 Shore Power
      (1) Output feeder cable to Shore power station damaged
      (2) Bolts and hardware rusted
   c. Breaker #3 Shore Power
      (1) Output feeder cable to Shore power station damaged
      (2) Bolts and hardware rusted
   d. Breaker #4 Shore Power
      (1) Control switch nonoperational
      (2) Output feeder cable to Shore power station damaged
      (3) Bolts and hardware rusted
      (4) Breaker nonoperational without bypassing safeties.

Cables for Shore power station #1 Grounded Distance 530 ft 6-cables 530 ft ea total 3180 ft of cable

3. Main Breakers supplying Shore power Breakers
   a. Breaker #1
      (1) Salt corrosion on control relays
   b. Breaker #2
      (1) Salt corrosion on control relays
4. Main Switchgear Transformer
   a. Rust on cooling Fins, vents, mounting bolts, and Ground connections
5. Condition of Vacuum switch supplying transformer
   a. Seals leaking
   b. High voltage cables insulation has salt buildup and evidence of tracking.

Shore Power stations on Mole Pier

1. Switchgear #1
   a. Igloo for Breakers #1&2
      (1) Seals on enclosures worn and cracked
      (2) Concrete has spalling and is breaking off in chunks
      (3) One set of cables to shore power station grounded and arcing to ground.
   b. Igloo for Breakers #3&4
      (1) Seals on enclosures worn and cracked
      (2) Concrete has spalling and is breaking off in chunks
      (3) Shore power plug Phase C removed because of damage

1. Switchgear #2
   a. Igloo for Breakers #1&2
      (1) Seals on enclosures worn and cracked
      (2) Concrete has spalling and is breaking off in chunks
   b. Igloo for Breakers #3&4
      (1) Seals on enclosures worn and cracked
      (2) Concrete has spalling and is breaking off in chunks

1. Switchgear #3
   a. Igloo for Breakers #1&2
      (1) Seals on enclosures worn and cracked
      (2) Concrete has spalling and is breaking off in chunks
   b. Igloo for Breakers #3&4
      (1) Seals on enclosures worn and cracked
      (2) Concrete has spalling and is breaking off in chunks

1. Switchgear #4
   a. Igloo for Breakers #1
      (1) Seals on enclosures worn and cracked
      (2) Igloo nonoperational due to blown cables
   b. Igloo for Breakers # 2
      (1) Seals on enclosures worn and cracked
   c. Igloo for Breakers # 3
      (1) Seals on enclosures worn and cracked
   d. Igloo for Breakers # 4
      (1) Seals on enclosures worn and cracked

Overall condition is poor. Supply cables to shore power stations (750 MCM THHN) have the outer shielding damaged and the insulation of the cables is compromised in the duct banks. This has led to the cables shorting out to ground in the duct banks. The wire is THHN insulation, meaning it is suitable for **dry or damp** locations. The insulation that is damaged is the flame retardant insulation leaving the heat-resistant insulation as the sole insulation. Since the switchgears are not weather proof the base of the switchgears are filling up with water from salt water spray and rain, and this is causing the ducts to fill with a mixture of fresh and salt water. The THHN is not designed to be in water continuously. This is leading to breakdowns in the insulation and causing the cables to short to ground. With the Ct's having the cracked housings from over tightening of the mounting bolts during construction, the CT windings are now exposed to the elements. This is causing the CT's to give false readings to the control circuits of the breakers and not allowing them to operate correctly. Even though the exterior is made of Stainless steel,

the interior components are mad of mild steel. Most of the electronic controls are being exposed to the salt air corrosion and leading to failures of the safety devices installed on the breakers. Without the constant preventive maintenance and cleaning, the switchgears are slowly deteriorating to a point that an explosive electrical failure is possible. The only way to curtail further damage is to have a positive enclosure installed. Instead of maybe 2-3 years left of functioning equipment we could get 10-15.

I am trying to get pricing on repair parts and what we have so far is,
Overcurrent relays --$2250 ea total of 5 $11,250
CT's--around $700 to $800 ea total of 77 $ 61,600
Control Pin connectors—Finally found and ordered
Cable 750MCM THHN total of 7780 feet.--$19,500 per 1000 ft reel--$156,000 in cable alone
Breaker control switches--$950 ea total of 5 $4750
Totals for estimates so far: $250,000

For the Fresh water valves and the wastewater valve stations

Fresh Water
At all 16 stations we have 4 valves, one backflow preventer, and one meter.
All 16 stations have extensive rust on the piping and valves which is preventing the proper operation of the stations. The relief valve tubing on the backflows are cracked and in need of replacement. Meters are due for calibration.

Sewage
At all 16 stations we have one valve.
All 16 stations have extensive rust on the piping and valve which is preventing the proper operation of the stations.

Lift Station on Mole Pier

Needs a new control cabinet. Controls are rusting and have signs of hydrogen sulfide corrosion.