



**U.S. Army Corps of Engineers**  
Engineering and Support  
Center, Huntsville

## **Training Support Center**

**Building 2327**  
**Fort Sill, OK**



**POTR - Phase I (Project Review)**  
**Training Support Center (TSC) - Medium**  
**Project No 20707**

**7 November 2012**

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## **CHAPTER 1 - GENERAL**

### **1-1 Purpose**

The intent of this document is to present the findings of the Phase I Post-Occupancy Technical Review performed on Building 2327 at Fort Sill in Lawton, OK. The POTR was performed by the HNC team consisting of Molly Richardson and Blake Terry on 7 Nov 2012.

### **1-2 Facility Description**

Building 2327 is a Medium Training Support Center that was occupied in May 2011. Hours of operations for the facility are Monday thru Friday from 0700 to 1630 and weekend hours are available. All instructors have key card access. The average number of visitors per day for the entire facility is 50-100 people. The facility has two simulation rooms, retail and secure storage, a break room, admin space and restrooms. The Warehouse Area includes a lobby, racks that are tiered 3 high, a charging area and 3 loading bay doors.

### **1-3 POTR Team Members**

The following is a list of HNC's team members that participated in the POTR:

- Molly Richardson – Structural Engineer
- Blake Terry – Mechanical Student Intern

### **1-4 Meeting Contacts**

The following is a list of individuals that were contacted during the POTR:

- Randall Kandall – USACE, Quality Assurance
- Justin Sweeten – USACE, Construction Manager
- John Rutledge – DPW, QAE
- Joe Justice & Brian Fannin – VT Group
- David Harper – DPTMS, Division Chief, Training
- Steven Schwandt – DPTMS, TSC End User

A roster for meeting attendees and contact information is attached in Appendix A.

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### 1-5 Design and Construction Modifications

The design contractor for this project was PSA-Dewberry Inc. The construction contractor for this facility was Ross Group. The following is a list of the major modifications during the project.

- A modification was submitted to add air conditioning to the Communications Room.
- Major roof leak during construction between the warehouse and administration roof structures. This was fixed while during construction. The warehouse still has some minor roof leaks.
- After construction, walls were constructed in the admin space to create an office.

### 1-6 Construction and Ongoing Issues

- Water seeps into the Fabrication Room from the concrete pad/dust collector area.



- The floor in the warehouse was not finished correctly and there is cracking throughout as well as some water type damage.



- Piping from administrative area shakes when being used and makes loud rattling noises.



#### 1-7 Overall Satisfaction

The user of the facility is very satisfied with the building. There are a ongoing issues they are still working to resolve, but overall the facility meets their demands. They were very pleased with the contractor and local district office's assistance and attention to their needs.

## CHAPTER 2 - ARCHITECTURAL

### 2-1 General Discussion

- Parking: There are not enough parking spots to fully support staff & troops on high demand days. Currently, the facility has approximately 25 parking spots and overflow parking is located behind the parking lot in a grass/gravel area.
- Restrooms: There are an adequate amount of restrooms available throughout the facility.
- Classrooms: There are no classrooms in this facility. The user indicated there was a demand for them.
- Simulation Rooms: There are two EST rooms in this facility with adequate space.

### 2-2 Lessons Learned/ Standard Design Impacts

- In the admin area, include at least one office.
- Floors in the Simulation Rooms are sealed concrete. Use a semi-gloss or no gloss seal to avoid glare on the screens and slick surface during spills.
- According to the user more power lift equipment is needed and used; therefore, the charging area needs to be larger and more flexible outlets are needed (or requirements for such equipment should be set up front).
- More waiting space for soldiers and sound proofing on EST walls.
- Washer and Dryer outlets are requested. Battlefield and other clothing is available for loan and washing in house would be more efficient.

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**CHAPTER 3 - MECHANICAL**

**3-1 Existing Conditions**

- The facility consists of three distinct space types: heated warehouse, training areas, and administrative areas.
- The warehouse is heated by gas fired radiant heaters. Ventilation is provided by ventilation fans and wall louvers. Cooling is provided by the ventilation system.
- There are 4 HVAC zones within the building.
- There is an emergency shutdown button in the administrative corridor.



- The facility is equipped with a wet pipe sprinkler system and fire pumps.

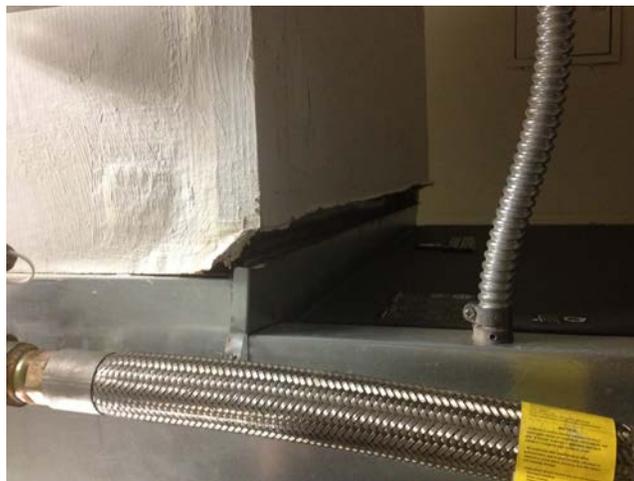


### 3-2 Functionality Issues

- The user is unhappy with the HVAC system installed. They do not understand the controls and it has malfunctioned frequently since move in.



- The maintenance crews have difficulty replacing the HVAC filters due to the layout/design.



- The fans and louvers in the work shop do not function properly.



### 3-3 Lessons Learned/ Standard Design Impacts

- The tank temperature of the water heater needs to be 140°F to prevent bacterial growth.



## CHAPTER 4 - ELECTRICAL

### 4-1 Existing Conditions

- Lighting. Occupancy sensors are on light switches. The user agreed that emergency lights have come on in the event of a power loss. There is adequate exterior lighting.
- Lightning Protection System. Installed at unknown depth.
- Outlets: Plenty of outlet availability throughout facility.
- Wiring. Concealed and adequately labeled.

### 4-2 Functionality Issues

- The plugs in the work shop area have the wrong voltage.
- Lighting is adequate, except the maintenance of the bulbs in the warehouse is difficult due to their extreme height.



### 4-3 Lessons Learned/ Standard Design Impacts

- Occupancy sensors need to be looked at during the pre-inspection to ensure correct installation.

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**CHAPTER 5 - MISCELLANEOUS**

**5-1 Civil/Site**

- No driveway was designed or constructed up the fabrication shop doors. The users back up trailers through the grass.



- A modification of the driveway was needed to allow for adequate turning space. The truck drive up to the loading docks is through the parking lot which is undesirable. The user indicates that the loading dock doors are not tall enough.



**5-2 Structural**

- No Structural issues have been reported or were discovered.

**5-3 Lessons Learned/ Standard Design Impacts**

- N/A

# **APPENDIX A**

# **ROSTER**

# Post Occupancy Technical Review (POTR)

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Professional Responsibility: <u>Construction Manager</u>	

Name: <u>John Rutledge</u>	Organization: <u>DPW</u>
Phone: <u>(580) 442-1690</u>	Email: <u>john.l.rutledge</u>
Professional Responsibility: <u>DPW QAE</u>	

Name: <u>Joe Justice</u>	Organization: <u>VT Group</u>
Phone: <u>(580) 442-2924</u>	Email:
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Name: <u>Brian Fannin</u>	Organization: <u>VT Group</u>
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Name: <u>DAVID HARPER</u>	Organization: <u>DPTMS TRG</u>
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Name: <u>Steven Schwandt</u>	Organization: <u>DPTMS</u>
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Professional Responsibility: <u>End User Training Support Officer</u>	

# **APPENDIX B**

## **NOTES**

# Post Occupancy Technical Review (POTR)

Cnt. # W912BV-09-  
C-2004

## TRAINING SUPPORT CENTER

-05-  
D-2003

Installation: Ft. Sill, OK

Project Number: 020707 Building Number: 2327

Name of Facility: Training Support Center - Medium

Type of Facility: 44,000

Standard  Non-standard  Modified

Other: \_\_\_\_\_

- short

Hours of Operation: 0700-1630  
M-F

Other: maybe weekends  
all instructors have  
key

TSC Chief: Ross Group

Construction Contractor: PSA-Dewberry Inc. - Design

Date Occupied: May 18, 2011

Date Visited: 7 Nov 12

Overall:

1 Very Dissatisfied  2 Dissatisfied  3 Indifferent  4 Satisfied  5 Extremely Satisfied

4.5

no DPW issues  
lot of HVAC control issues

RFP # W912BV-09-R-2036

# Post Occupancy Technical Review (POTR)

Feedback regarding the Contractors:

Ross Group

pretty responsive

minor issues

exterior siding - design

Design-Bid-Build  
AE subcontracted  
design

Construction modifications that were required:

Comm room no AC or ceiling  
ISA, supply air req. + 68°

More TRADOC than ForceCom  
↳ basic training      ↳ operational brigades

4 temp building  
Range of Classroom

# Post Occupancy Technical Review (POTR)

Construction issues/On-going maintenance:

light issues through to ESTs  
some minor leaks  
temporary wall to office  
water seeping into fab room

inst. status report - no landscaping

Major issues from the Pre-occupancy inspection:

no - came during first rainstorm & leaks  
leaks where buildings connect

# Post Occupancy Technical Review (POTR)

Does the facility meet your needs and expectations:

What feedback have you received from the staff:

washer/dryer outlets  
battlefield clothing, need to wash supplies  
sound proofing

Any overall (big picture type) comments:

Floors in EST are sealed concrete  
- don't use glossy seal

powerlift equipment need more flexible  
charging stations/better upfront requirement

maintenance room for user changes

Compressor issues - too small

More waiting space, wish had classrooms

# Post Occupancy Technical Review (POTR)

0-5

Does the reception/service window function well?

—

What is the approximate number of visitors per day?

50-100

Is there adequate Staff Parking?

No, 25 spaces

Does the facility offer flexibility?

Yes

Does the facility support the full time staff and their missions efficiently?

Made it work, yes.

Is the Site Approach and Exit to the Warehouse adequate?

Yes, after mod. Trucks go through parking lot

Telecom Room (TR):

Does the provided locking mechanism adequately limit access to this area and function properly?

yes, mod to add unit

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

# Post Occupancy Technical Review (POTR)

Does the user feel the HVAC system is doing the job of providing a comfortable environment?

when it works

Is there a space(s) that seem to get too hot within the facility while at the same time a nearby space seems to be too cold?

4 zones No problems when working correctly

Does the Classroom/Training Space seem to get too hot or too cold when the room is unoccupied?

Are the thermostats working properly? If not, have the user to describe how or why it seems not to be working properly.

Do not sync.

Can the user identify any miscommunication between what was described in the RFP and what was actually built?

Is there anything in particular about the HVAC that stands out to the user that they like (Example: they like the particular thermostat b/c of all the information it displays, etc.).

User- Do you understand how the system is supposed to work (not from a technical perspective, but from functionality perspective)?

yes

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

Workshop  
- Plus wire  
wrong voltages  
too hard  
to use  
dust collection  
system.

Bay Exhaust  
Fans

Many  
Issues  
with  
HVAC  
overall.  
Geothermal  
System.

Johnson  
Controls

# Post Occupancy Technical Review (POTR)

Is the user happy with the HVAC system installed?

No

Are maintenance schedules of the HVAC system being properly followed?

yes

Identify any other issues and or problems encountered with the HVAC system.

—

Who are the points of contact for HVAC related issues?

Johnson controls

Can documentation of any after action reports or maintenance service/work orders of the facility from the past six months be provided? If yes obtain documentation before leaving site, if no, discuss a means in which the documentation can obtained at a date after leaving site, preferably at least 7 to 10 business days.

Were there any change orders that affected the HVAC and plumbing?

Can any after action reports or lessons learned be provided?

Describe the commissioning process for the facility. What issues were discovered and resolved?

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

# Post Occupancy Technical Review (POTR)

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

Do plumbing fixtures function properly?

Yes

Is there anything in particular about the plumbing system that stands out to the user that they like (Example: they like the automatic fixtures and the manual flush option on it, etc.).

~~Waterless~~ ~~urinal~~ urinal

Is the user happy with the plumbing system installed?

Yes

Is the hot water being stored at a temperature of 140 degree F.?

Yes

Are maintenance/service schedules of the plumbing equipment being properly followed (pumps, flush valves, etc.)?

—

Identify any other issues and or problems encountered with the plumbing system.

—

Can documentation of any after action reports or maintenance service/work orders of the facility from the past six months be provided? If yes obtain documentation before leaving site, if no, discuss a means in which the documentation can obtained at a date after leaving site, preferably at least 7 to 10 business days.

Dust  
Collection

# Post Occupancy Technical Review (POTR)

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

Who are the points of contact for any plumbing related issues?

Are there any new and innovative technologies planned to be installed (solar, grey water, etc.)?

geothermal heating  
radiant

Are high efficiency mechanical equipment installed as part of the HVAC system (Example: chiller, boiler, pumps, etc)?

Can documentation of the energy usage of the facility from the past six months be provided (gas, water, etc.)? If yes obtain documentation before leaving site, if no, discuss a means in which the documentation can obtained at a date after leaving site, preferably at least 7 to 10 business days. After receipt of the information compare the values to the Utility Demands Estimate spreadsheet.

What types of plumbing fixtures are installed in the facility (Example: high efficiency toilets/urinals, waterless urinals, low flow lavatories)?

Verify that high efficiency water heaters (min. 93%) being used to supply domestic hot water?

Is all the piping in the mechanical room labeled and legible?

Heat  
is  
not  
used  
friendly  
120F

# Post Occupancy Technical Review (POTR)

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

Are plenum return's used or ducted returns used?

What kind of fire protection system is installed (dry pipe, wet pipe, etc.)?

Water - leaks

Verify the location of the emergency shutoff (shuts off the HVAC)?

-



Verify the submission of the Commissioning report.

- yes

Verify the submission of the TAB report.

Verify where pilot transverses were done (refer to TAB report if necessary).

If possible, verify the position of the manual outside air damper (likely located in the mechanical room near the roof).

Were there any suggestions made in the commissioning report for the user to take action on as a benefit for when the building became occupied. If so point those out to the user and ask if they were implemented.

# Post Occupancy Technical Review (POTR)

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

Are adequate exterior lighting systems provided for parking areas, sidewalks, building entrances and perimeter for safety, evacuation, and security measures?

Good

If near flight line, is the site lighting installed so that night time aircraft operations are not impacted?

Good to Go

Does emergency lighting switch OFF when area not occupied or during unoccupied hours?

Yes, yes it works

Document if the transformer is metered?

Does the transformer meter, gas meter, and water meter appear to be connected to the Building Monitoring System?

only electric

At a minimum, has the transformer meter, gas meter, and water meter been integrated with the post-wide UMCS/EMCS and are the required data logging being recorded/stored for the facility?

Was an adequate Lightning Protection System installed?

- Yes, good grounded ✓

electrical meter

gas & water have lines but not connected

# Post Occupancy Technical Review (POTR)

Attach other sheets of notes from the walkthrough that include the specific notes from each area.

Is wiring concealed from view in finished rooms/areas?

No

Are concealed/flush boxes used for devices in finished areas and on exterior walls?

No

Is there adequate working clearance for electrical and communication panels?

Decent, only prob charging filters on ~~base~~

# Post Occupancy Technical Review (POTR)

1. Admin Area:
2. Private Office:
3. Conference Room:
4. Break Room:
5. Administration Storage:
6. Lobby:
7. Secure Operations Storage:
8. Arms Vault:
9. Telecommunications Room:
10. EST Training room:
11. Storage:
12. Warehouse:
13. Warehouse racks:
14. GTA Storage:

*NO high florescent  
lighting  
- energy efficient  
- silver lead*

# **APPENDIX C**

# **WORK ORDER REQUESTS**

## WORK ORDER REQUEST

PHONE 2-3251

DATE	W/O NUMBER	FAULT	REMARKS	DATE COMPLETED
1-Sep-11	RX29245R	AIR COMPRESSOR	SENT TO BUILDER	17-Sep-11
15-Sep-11	RM29637	GARAGE DOOR	waiting DPW to fix 3-13-12	1-May-12
Oct-12	125174	MOLD IN OFFICES 14 oct 11	TOOK SAMPLES	12-Oct
Oct-11	1244906	AIR CONDITION	JOHNSON CONTROLS	Oct-11
Oct-11	125563	AIR CONDITION	JOHNSON CONTROLS	Oct-11
22-Oct-11	127867	SINK DRAIN MENS ROOM		Oct-11
25-Oct-11	129504	AIR CONDITION		Oct-11
26-Oct-11	129570	Paint Garage Dr Fab rm	Warrenty	
26-Oct-11	129681	Garage Dr Fab Rm Rail		1-May-12
27-Oct-11	1210020	heat/exc		11-Nov
21-Nov-11	1216899	Dock Light	wrong lite fixed	11-Nov
21-Nov-11	1216960	co2 sensor		21-Nov-11
23-Nov-11	RX1200-2J	EST 3 Thermostat	Quad chart inputed	11-Dec
7-Dec-11	1222345	heat Rm 117		9-Dec-11
7-Dec-11	1222349	spray warehouse		9-Dec-11
10-Jan-12	1230796	compressor		8-Feb-12
12-Jan-12	1232676	air regulator	rm 106 3ea	8-Feb-12
6-Feb-12	1239696	fire supr	SENT TO BUILDER didn't go	7-Feb-12
6-Feb-12	1239698	exit dr key	rm 114	8-Feb-12
6-Feb-12	1239699	parking lot lites	SENT TO BUILDER didn't go	7-Feb-12
6-Feb-12	1239701	Dock Light inside	SENT TO BUILDER didn't go	7-Feb-12
6-Mar-12	1248102	fire alarm box		6-Mar-12
14-Mar-12		air condition	give to Steve S	14-Mar-12
17-Apr-12	1260072	garage door limit		1-May-12
18-Apr-12	1261612	elec i-see-o-hall		20-Apr-12
26-Apr-12	1264355	AIR CONDITION		26-Apr-12
27-Apr-12	1264751	AIR CONDITION	zone 2 not working	27-Apr-12
28-Apr-12	1264956	air compressor		28-Apr-12
2-May-12	1266236	air compressor		2-May-12
3-May-12	1266555	fire sup sys fab rm	redu	12-Sep
3-May-12	1266557	parking lot lites	redu	10-May-12
3-May-12	1266560	dock lite switch	redu	10-May-12
11-May-12	1268627	fire alarm		11-May-12
15-May-12	1269197	toilet		15-May-12
11-Jun-12	1276764	aircondition	rm 103	11-Jun-12
11-Jun-12	1276772	vent sys	warehouse/fab	12-Sep
27-Jun-12	1282394	aircondition	rm 104	complete
27-Jun-12	1282570	aircondition	rm 103 parts on order	complete
27-Jun-12	no number	fire sup sys fab rm	sent allen over to look	12-Sep
1-Aug-12	1292771	Key in warehouse dr		1-Aug-12
16-Aug-12	1295769	Outside Faucet rm 116		16-Aug-12
20-Aug-12	1296986	Compressor	oil low	21-Aug-12
20-Aug-12	1296988	Fire exit signs	back up batteries	21-Aug-12
4-Sep-12	12102236	air condition	building	4-Sep-12
7-Sep-12	12105905	air condition	building	7-Sep-12
1-Oct-12	131754	sus rack outside faucet	warehouse	12-Oct-12

