

Chemical/Radiation Protection (CARP) Building



Omaha Public Power District

OPPD

Field Report

To: Keith Kirchner, Pat Poepsel, Rick Niedergeses	
From: Cameron Collingsworth	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: November, 9 th 2011	Field Report No: FR-083

Team Members:

Cameron Collingsworth (HDR)
 Bryan Kumm (HDR)
 Hugh O'Grady (HDR)

Field Activity Objective:

Our field activity objective is to observe the Chemistry & Radiation Protection (CARP) Building and its surroundings for evidence of damage relating to the flood event.

Activities Conducted:

The team visually inspected the interior and exterior perimeter of the building for signs of distress and documented areas of concern with photographs.

Data Obtained:

Each HDR team member noted their observations as the building was inspected. Key areas of concern were specifically documented and photographed. Discipline specific checklists were completed from the field observations to ensure all key items were investigated. Team members discussed their observations during and after the inspection to ensure a consensus was formed on all findings at the time of the inspection.

Observations:

At the time of our field observations water had receded to elevations around 991ft, which are within normal levels. During the flood event, the building was not subjected to floodwaters due to the use of an Aqua Dam. No signs of distress were seen in or around the building at this time.

Security-Related and/or Personal Information Redacted



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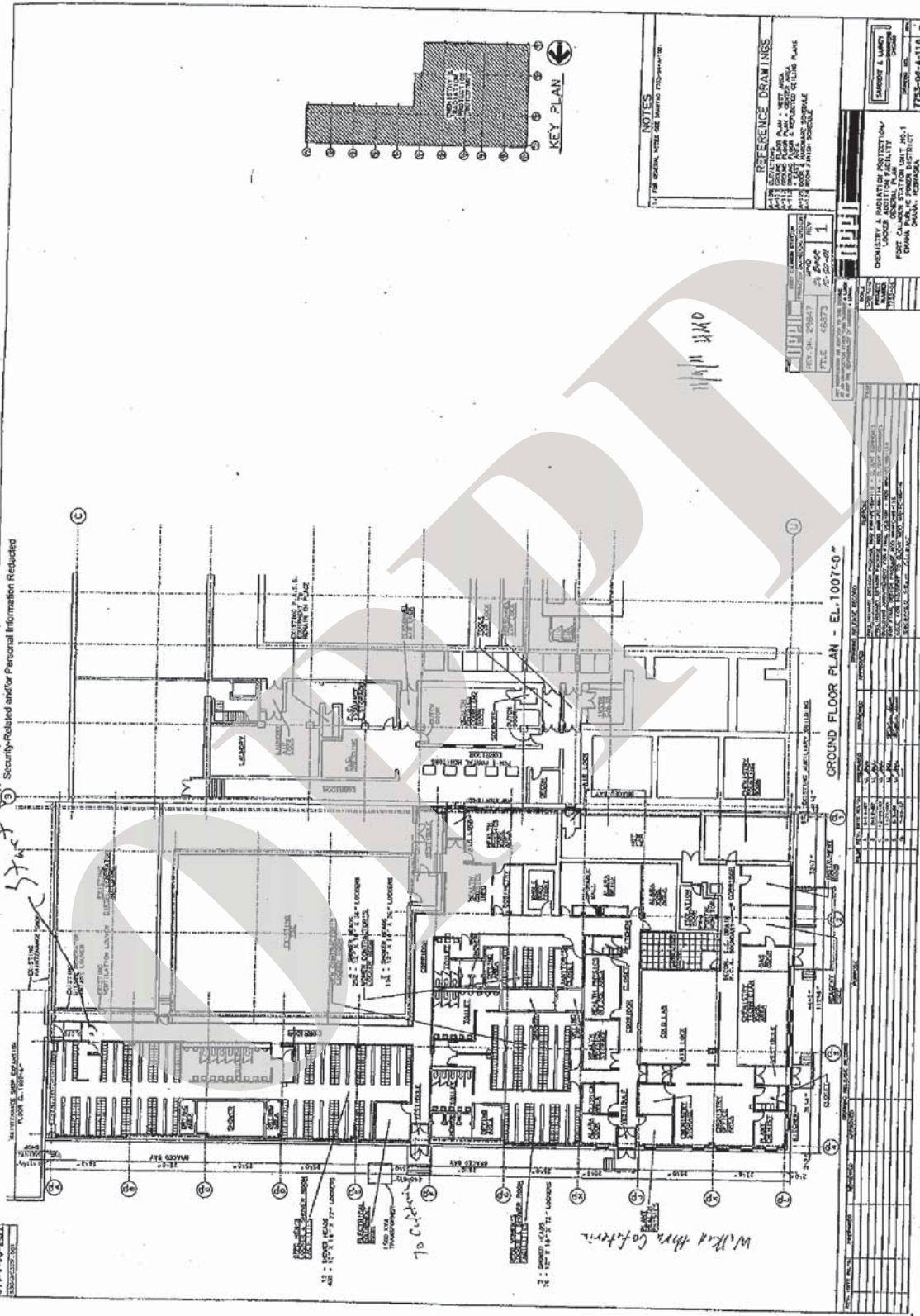
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**OPPD – FORT CALHOUN STATION
2011 FLOOD ASSESSMENT - GEOTECHNICAL CONDITION SURVEY**

Structure Number:		Structure Name:	CARP Building
Date:	11/09/11	Inspected By:	Bryan Kumm
Weather:	Sunny 40° F		
Current Flood Elev.:	~993'		

Activity 1 – Ground Subsidence			
Is there observable ground subsidence?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Location			
Areal extent			
Depth			
Cracking	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Vertical/lateral offset			
Is there observable pavement subsidence?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Location			
Areal extent			
Depth			
Cracking	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Vertical/lateral offset			

Activity 2 – Erosion			
Is there observable scour?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Location			
Areal extent			
Depth			
Dimensions			
Is there observable piping (sand boils, sinkholes)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Location			
Areal extent			

**OPPD – FORT CALHOUN STATION
2011 FLOOD ASSESSMENT - GEOTECHNICAL CONDITION SURVEY**

Dimensions	
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Activity 3 – Foundation Systems	
Are the foundation plans available?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Is the geotechnical report available?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Is the structure supported on deep foundations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Deep foundation type	
Design capacity	
Is the structure founded on spread footings?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Allowable bearing pressure	3 ksf
Sizes of footings	
Is the structure founded on a slab or grade?	No
What is the primary bearing layer for the foundations?	New Structural Fill
What are general subsurface conditions?	Fill overlying alluvial deposits of silt and sand.
Any observable distress?	No
Condition of floor slabs?	Good

OPPD – FORT CALHOUN STATION
2011 FLOOD ASSESSMENT - STRUCTURAL CONDITION SURVEY

Structure Number:		Structure Name:	CARP Building
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USER NOTES / INSTRUCTIONS

1. The purpose of this condition survey is to document observable signs of distress in the structural systems of the Fort Calhoun Nuclear Power Plant due to the 2011 flood event.
2. This inspection is not a condition survey of the entire facility but an opinion of structural damage due to the flood event only. Therefore, documented items of structural distress shall be limited to those attributed to the flood event.
3. Each observed structure shall include a review of existing inspection reports to verify if the observed item was reported prior to the flood event. If possible, review previous inspection reports prior to the on-site structure inspection.
4. Each surveyed structure shall include a review of the available existing structural drawings. If possible, review existing drawings prior to the on-site structure inspection.
5. Structures to be surveyed for flood damage were selected and prioritized by OPPD and include, but are not limited to buildings, process structures, equipment foundations, tank foundations and electrical towers.
6. Where items of distress are found, note the specific location, room number (if possible), nature of the distressed element, loads presently applied and/or load rating of that element, and estimated effect of the flood forces. Use the additional sheet as necessary to document the item. Document each area of distress with photos.
7. Possible damage from flood forces on the structure may be caused by, but are not limited to the following:
 - a. Foundation uplift due to buoyancy forces.
 - b. Undermining of foundations due to flood dynamic (velocity) forces.
 - c. Scouring of foundations due to flood dynamic (velocity) forces.
 - d. Compressibility / consolidation of existing soils due to changes in moisture content.
 - e. Expansive clay materials that undergo volume changes due to the changes in moisture content.
 - f. Settlements due to the loss of soil shear strength.
 - g. Cracking in walls due to additional lateral pressures from higher floodwater elevations.

**OPPD – FORT CALHOUN STATION
2011 FLOOD ASSESSMENT - STRUCTURAL CONDITION SURVEY**

Structure Number:		Structure Name:	CARP Building
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Date:	11/9/2011	Inspected By:	Cameron Collingsworth
Weather:	Partly Cloudy, mid 50's		
Current Flood Elev. Relative To FFE:	Irrelevant, waters have since receded to normal levels		

Activity 1 – Description of Structure	
Drawing Ref:	OPPD File #'s: 46866, 46867, 46868, 46869, 46870, 46871, 46872, 46873, 46874, 46875, 46879, 46880, 46881, 46882, 46888, 46889, 46896, 46907, 46921, 48195, 48896, 48897, 49364, 49365, 49368, 49372, 49382, 49383, 49384, 49385, 49386, 49393, 56533, 56534, 57486, 57487, 57488, 57489, 57490, 57491, 57988, 57989, 57999, 58000, 58001, 58002, 58127, 49382
Sketch Map – Orientation:	N/A
Foundation:	The building is constructed on a shallow foundation system. The foundations are continuous around the building perimeter and extend below frost depth. Interior column footings are isolated spread footings that reside below the floor slab. The wall shared by the cafeteria/office addition does extend below frost depth because it was originally an exterior wall.
Superstructure:	Above grade, the structure is comprised of masonry partition walls supported on a thickened slab, steel beams and columns, most of which are part of a pre-engineered building system others are utilized as intermediate gravity members only. The cafeteria/office addition was constructed as a pre-engineered building with tie beams below the slab and a girt system spanning north to south. The roof appears to be a metal deck with concrete topping.
Photographs:	

Activity 2 – Previously Documented Condition of Structure		
Item No.		
1	Title:	N/A
	Date:	N/A
	Author or Source:	N/A
	Summary of Condition:	N/A

Activity 3 – Present Condition of Structure	
General Description:	All rooms were observed in the CARP addition as well as the Cafeteria/Office addition. No signs of distress were observed that would be attributed to the recent flood event. Several areas showed signs of apparent roof leakage.
Overall Alignment	

**OPPD – FORT CALHOUN STATION
2011 FLOOD ASSESSMENT - STRUCTURAL CONDITION SURVEY**

Structure Number:		Structure Name:	CARP Building
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Settlement:	None
Deflection:	None
Expansion:	None
Contraction:	None
Other:	None

Activity 4 – Portions Showing Distress		
Item No.		
1	General Description:	N/A
	Distress Item Previously Reported (Y/N) – Report Number?	N/A
	Photograph:	N/A
Nature of Loading & Detrimental Elements:		
Exposure		
	Freeze / Thaw:	N/A
	Chemical Attack:	N/A
	Abrasion, erosion, cavitation, impact:	N/A
	Salts or Chloride Solution:	N/A
	Other:	N/A
Loading		
	Dead:	N/A
	Live:	N/A
	Impact:	N/A
	Dynamic / Vibration:	N/A
	Flood:	N/A
	Other:	N/A
Soils (Foundation Conditions)		
	Flood Inundation (Y/N)?	N

