

PLC Professional Loss Control, Inc.

STRUCTURAL STEEL ANALYSIS  
for  
PEACH BOTTOM GENERATING STATION

Calculation No. 97

Unit 2,3

Turbine Building El. 116'-0"

Janitor Room

Fire Area 116

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## PEACH BOTTOM GENERATING STATION

1. AREA DESCRIPTION

The area under consideration is the Janitor Room on the 116'-0" elevation of the Turbine Building (Fire Area 116). The bounding walls are constructed of reinforced concrete with an average thickness of 1 ft. The total surface area for heat transfer is 426 ft<sup>2</sup> (see Attachment A for a sketch of the area under consideration).

2. COMBUSTIBLE LOADING

There are no combustible liquids or cable trays located in this area.

3. VENTILATION PARAMETERS

There is one door which enters this area.

<u>Door</u>	<u>Size</u>	<u>Location</u>
124	3'-0" x 7'-0"	West Wall

4. CASES EXAMINED

Since there are no exposed fixed combustibles in this area, no cases were examined for a general room fire.

## 5. RESULTS

No general room fire was postulated because of the lack of exposed fixed combustibles in the area.

There are no cable trays in this area to present a localized heating exposure to the structural steel.

## 6. EFFECTS OF TRANSIENT COMBUSTIBLES

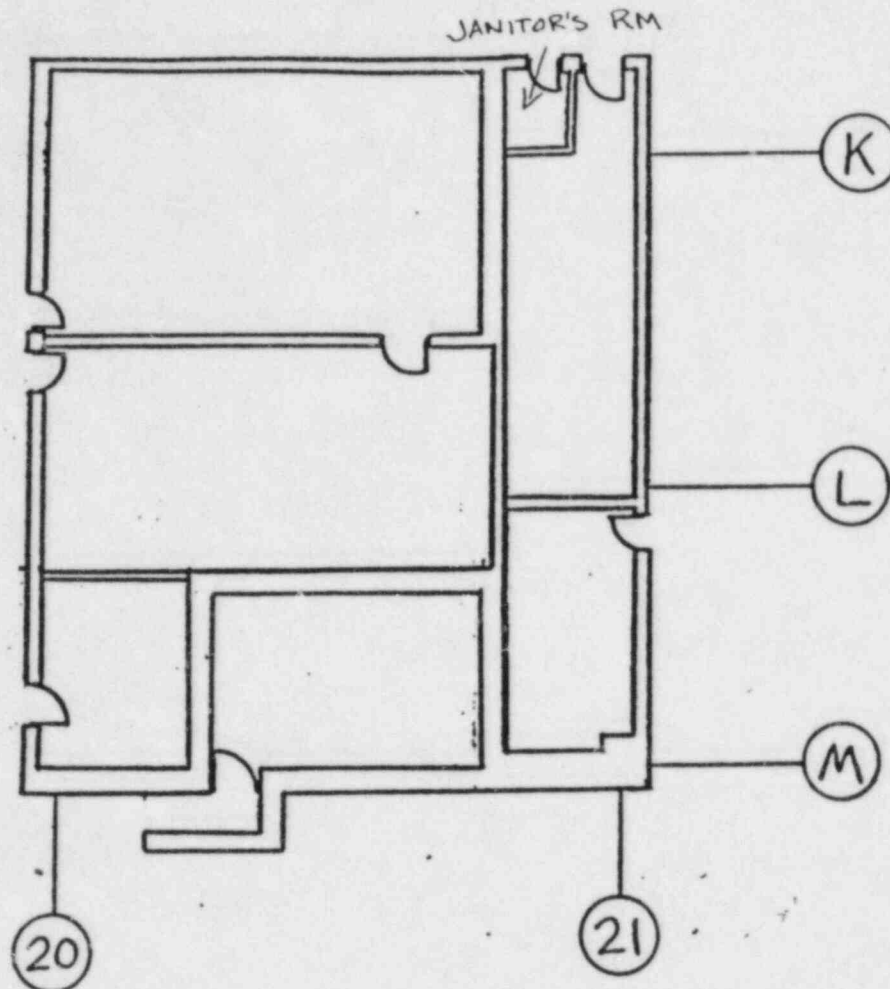
This area contains no exposed fixed combustibles. The table below lists the maximum heat release rate for transient combustibles for different fire durations which result in an area temperature less than 1100°F.

<u>Fire Duration</u>	<u>Q/A (kW/m<sup>2</sup>)</u>	<u>Q(kW)</u>
1 hour	10.5	416
2 hours	8.0	317
3 hours	6.5	257

The distance between the floor and the deepest beams supporting the ceiling is 16'-8 1/2". The heat release rates required of floor level transient combustible fires to produce plume temperatures of 1100°F, 1300°F and 1500°F at the bottom

flange of the beam have been determined and tabulated below. For the temperatures greater than 1100°F the time required to heat the sizes of the beams supporting the ceiling have also been determined.

<u>Time to 1100°F (min)</u>		
<u>T(°)</u>	<u>Q(kW)</u>	<u>W16 x 36</u>
1100	7,257	-
1300	9,549	14
1500	12,042	10



Unit 2,3 Turbine Building Elevation 116'-0"  
Janitor's Room

### Surface Area Calculation

<u>Walls</u>		
North wall	(6' x 18')	108 ft <sup>2</sup>
East wall	(5' x 18')	90 ft <sup>2</sup>
South wall	(6' x 18')	108 ft <sup>2</sup>
West wall	(5' x 18')	90 ft <sup>2</sup>
		<hr/>
		396 ft <sup>2</sup>
<u>Ceiling</u>		<hr/>
		30 ft <sup>2</sup>
 Total Area for Heat Transfer		 <hr/>
		426 ft <sup>2</sup>