

CRWMS/M&O

Non-Q Design Analysis Cover Sheet

Complete only applicable items.

1.

QA: N/A

Page: 1 Of: 5

2. DESIGN ANALYSIS TITLE

NORTH PORTAL - SANITARY SEWER CALCULATION - SHOP BUILDING #5006

(SCP B: N/A)

3. DOCUMENT IDENTIFIER (Including Rev. No.)

BABBAD000-01717-0200-00143 REV 01

4. REV. NO.

01

5. TOTAL PAGES

5

6. TOTAL ATTACHMENTS

1

7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH

I-1

8. SYSTEM ELEMENT

MGDS

	Print Name	Signature	Date
9. Originator	R. Blackstone	<i>R. E. Flye</i> FOR R. BLACKSTONE	1-24-96
10. Checker	D. F. Vanica	<i>D. F. Vanica</i>	1-24-96
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12. Department Manager	G. N. Kimura	<i>G. N. Kimura</i>	1-25-96

13. Remarks

Design Analysis Revision Record

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1.

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4. Revision No.	5. Description of Revision
00	Initial Issue
01	Reformatted to NAP-MG-013, Rev 0 Revised Title Deleted TBV-122 Changed QA Classification to QA: N/A Editorial Changes

1. PURPOSE

The purpose of this design calculation is to determine the demand on the waste system and to size the sanitary sewer line serving the Shop Building #5006 in accordance with the Uniform Plumbing Code (Section 4.4.1) and U.S. Department of Energy Order 6430.1A-1540 (Section 4.4.2).

2. QUALITY ASSURANCE

This analysis is non-Q because it is for a temporary item. The Determination of Importance Evaluations (References 5.1 and 5.2) of the Shop Building and Sanitary Sewer Collection System has determined that no quality assurance (QA) controls are applicable within the context of this analysis.

3. METHOD

The method used for the calculations is based on the guidelines from Section 4.4.1. Fixture units are assigned for each plumbing fixture which determines the total fixture units. The size of the drainage and vent pipe is determined by the UPC.

4. DESIGN INPUTS

4.1 DESIGN PARAMETERS

Number of plumbing fixture units = 74 (Attachment I)

4.2 CRITERIA

The Plumbing Design for the Shop Building will be designed in accordance with DOE Order 6430.1A (Section 4.4.2) and appropriate state and local codes (ESFDR Sections 3.2.1Q, 3.2.1R, and 3.2.1S, Reference 5.4).

4.3 ASSUMPTIONS

Not used.

4.4 CODES AND STANDARDS

4.4.1 International Association of Plumbing and Mechanical Officers (IAPMO)

UPC 1991

Uniform Plumbing Code (UPC)

4.4.2 U.S. Department of Energy (DOE)

DOE Order 6430.1A-89

General Design Criteria

5. REFERENCES

- 5.1 Determination of Importance Evaluation for ESF Change House Facility and Shop Building BABBA0000-01717-2200-00007 Rev. 00.
- 5.2 Determination of Importance Evaluation for Subsurface Wastewater (Surface Portion) and Sanitary Sewer Collection Systems BABD00000-01717-2200-00009 Rev. 02.
- 5.3 Drawings:
 - 5.3.1 BABBAD000-01717-2100-27400-00 Shop-Bldg 5006 Plumbing & Piping First Floor Plan
 - 5.3.2 BABBAD000-01717-2100-27401-00 Shop-Bldg 5006 Plumbing & Piping Second Floor Plan
 - 5.3.3 BABBAD000-01717-2100-27402-00 Shop-Bldg 5006 Plumbing Isometrics and Retails
- 5.4 Yucca Mountain Site Characterization Project Exploratory Studies Facility Design Requirements, YMP/CM-0019, Rev. 1, ICN 3.

6. USE OF COMPUTER SOFTWARE

Not used.

7. DESIGN ANALYSIS

The number of plumbing fixtures is determined by reviewing the plumbing plan drawings (Reference 5.3) for the Shop Building. For each type of fixture the UPC (Section 4.4.2) assigns a unit value. The product of the number of plumbing fixtures and the unit value for each type of fixture nets the total number of fixture units. This number is then used to size the sewer main.

8. CONCLUSIONS

Based on the calculations shown in Attachment I, a 4-inch sewer main is required for the Shop Building.

9. ATTACHMENTS

ATTACHMENT

TITLE

I

Calculations

CALCULATIONS

SANITARY SEWER				
Fixture	No. Req'd A*	Units per Fixture B**	Fixture Units A X B	Remarks
Water Closet	6	6	36	
Urinal	2	2	4	
Lavatory	5	1	5	
Lavatories (Sets)				
Wash Fountain				
Shower (Stall)				
Shower Drain (Gang)				
Service Sink	4	2	8	
Mop Sink	1	3	3	
Lab Sink				
Cup Sink				
Kitchen Sink	1	2	2	
Electric Water Cooler				
Floor Drain	5	2	10	
Floor Sink	3	2	6	
Total Fixture Units			74	4 inch Building Sewer

* Number of Fixture Units required was obtained from References 5.3.1, 5.3.2, and 5.3.3.
 ** Units per Fixture values are obtained from Table 4-1 of UPC (Section 4.4.1). From Table 4-3 of UPC, a 4-inch diameter sewer is required for 74 fixture units.