



*Rec'd with letter  
4/17/95*

**ORIGINAL  
THIS IS A RED STAMP**

**OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.**

8 CAR NO.: YM-94-065  
PAGE: 1 OF 2  
QA

**CORRECTIVE ACTION REQUEST**

1 Controlling Document  
QAP-3-8, R4, QAP-3-9, R4, QAP-3-10, R4

2 Related Report No.  
YMP-94-01

3 Responsible Organization  
M&O

4 Discussed With  
J. Naff/B. Saunders/A. Segrest/F. A' rth

5 Requirement:

1) QAP-3-8, Paragraph 5.2 requires that specifications shall be checked for completeness and technical adequacy using the topics in Attachment I. QAP-3-9, Paragraph 5.24 requires that design analyses be checked to ensure the necessary detail in accordance with the Design Analysis Outline (Continued on next page)

6 Adverse Condition:

(1) No objective evidence exists for the discipline (structural) checks for Package 2C in the areas of design analysis, specifications and drawings for the identified items. Additionally, it was found that the M&O intends to utilize the relevant Review Summaries as the sole source of documentation to substantiate and validate the corresponding checks/reviews.

2) The checker for the Steel Set and Lagging Design Analysis did not receive a complete design analysis for review. The analysis was delivered to the checker over the period of one week in "pieces" and in various stages of completion. Additionally, the checker informed the audit team that they did not ensure that the design output was reasonable as compared to the inputs and the referenced Design Analysis Outline was not utilized. This checking process was completed 4/1/94.

3) For both the specifications and drawings concerning the structural discipline, it was found that the design analyses had not been completed and/or even checked. The checking process for all documents appears to have taken place at about the same time, with little or no controls applied to the procedure mandated requirements. (Continued on next page)

9 Does a Significant Condition Adverse to Quality exist? Yes X No       
If Yes, Check One:  A  B  C  D  E

10 Does a stop work condition exist? Yes      No X; If Yes - Attach copy of SWO  
If Yes, Check One:  A  B  C

3 Response Due Date:  
20 Working days From Issuance

11 Required Actions:  Remedial  Extent of Deficiency  Preclude Recurrence  Root Cause Determination

12 Recommended Actions:

1) Review other areas of the 2C Package and assure that checks/reviews were consistent.

2) Assure that the checking process for any ongoing design activities is conducted correctly.

7 Initiator *[Signature]*  
Richard G. Peck

14 Issuance Approved by:  
QADD *[Signature]* Date 8/5/94

15 Response Accepted  
QAR *[Signature]* Date 8/30/94

16 Response Accepted  
QADD *[Signature]* Date 9-1-94

17 Amended Response Accepted  
QAR *[Signature]* Date 4/10/95

18 Amended Response Accepted  
QADD *[Signature]* Date 4/13/95

19 Corrective Actions Verified  
QAR Date

20 Closure Approved by:  
QADD Date

OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

8 CAR NO.: YM-94-065  
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QA

**CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)**

5 Requirements (continued)

(Attachment 1) and that the design output is reasonable compared to the design input. QAP-3-10, Paragraph 5.2.4 requires that drawings are checked for completeness and technical adequacy utilizing Attachment 1 as appropriate. Additional requirements are detailed in Paragraph 5.2.4b through 5.2.4f to ensure that the relevant design parameters have been incorporated into the drawing, i.e., design inputs, assumptions were adequately described, the appropriate design method was used, and design input and verification requirements for interfacing organizations were specified.

- 2) QAP-3-9, Paragraph 5.2 requires that the checker shall check the design analysis for completeness and technical adequacy. Also, the checker must utilize the Design Analysis Outline (Attachment 1) to ensure the design analysis has been developed to the necessary detail. The checker must also ensure that the design output is reasonable as compared to the design input.
- 3) QAP-3-8, Paragraph 5.2.4 requires that the checker use Attachment 1 of the procedure to assure completeness and technical adequacy. Attachment 1 details checkpoints that are directly associated with the corresponding design analysis. QAP-3-10, Paragraph 5.2.4 details steps that require information taken directly from the associated design analysis.
- 4) QAP-3-9, Paragraph 5.24 requires that the checker document all comments clearly on the check copy.

6 Adverse Condition (continued)

- 4) The check copy of the electrical cable tray support design analysis was not available for review. The audit team was informed that it was not considered a QA record by the M&O and could therefore be discarded. The audit team is concerned that any OCRWM related documentation that could substantiate the design process, would be considered as disposable.

13 Recommended Action(s) (continued)

- 3) Re-evaluate procedural requirements detailing how reviews and checks are documented.

RESPONSE TO CAR NO. YM-94-065

ADVERSE CONDITION:

A. Remedial Action: All Items

- 1. All 2C design products containing errors (or where objective evidence that structural checks were performed does not exist) will be revised and will be rechecked in accordance with current QAPs. Interdiscipline reviews will be conducted as appropriate in accordance with QAP requirements. All Q-related drawings and specifications will be rechecked for errors. A review topic checklist will be filled out for each Q-related product rechecked. These checklists will be objective evidence that the checking process was followed. These checklists will not be QA records.
- 2. The MGDS Development Manager will issue a memo instructing MGDS that check copies of documents are Federal records and cannot be discarded. The records that were misplaced were for non-Q (electrical) design products.
- 3. Review with other M&O offices to determine if problem exists will be completed by 9/30/94.

10/29  
Alden - 10/31

Item 1 Responsible Individual: Robert Saunders  
Date of Completion: 9/30/94 (Anticipated Release of 2C)

Item 2 & 3 Responsible Individual: Alden Segrest  
Date of Completion: 9/30/94

Investigation: All Items

- 1. Preliminary copies of Design Analysis (structural) were used by checkers to verify Design Inputs to Drawings and Specifications during the design process. The Design Analysis Cover Sheet was not signed by the Department Manager and therefore was not complete.
- 2. Six non-Q check copies of 2C Design Analysis (structural) were misplaced and assumed to be discarded. The note in Paragraph 5.2 of the current QAP's indicate that the check copy is not a QA record but will be used during the final check of the document. Although the check copy is not a QA record, it is a Federal record and should not be discarded.
- 3. Investigation will be made to ensure no other records have been discarded. Early release documents will have new check copies.

8/17/94 LV. ESSB.GH. 8/94 -733

4. Item 2 occurred when the design inputs were being developed parallel and were not completed prior to the drawings and specifications being developed.

Root Cause: All Items

1. The Design of the package was started in accordance with Revision 3 of the QAP's and completed in accordance with Revision 4 of the QAP's. In addition, NLP-3-14, R00, P03 was superseded by the contents of QAP-3-10 Revision 4, and QAP-3-8 Revision 4. Change in procedures caused confusion as to which revision was the governing document for Package 2C. The procedures were not followed and documents clearly identified when preliminary data was used as input. Design inputs were being developed parallel and were not completed prior to the drawings and specifications being developed.
2. There are no procedural guidelines for handling Federal records.
3. The checking process (and interdiscipline review) in the current Design Control Process precedes the 90% Design Review. Many discrepancies being identified indicate they are a result of incorporating 90% design review comments.
4. The actual checking process is not well documented.
5. Direction was not provided to designers for the storage of all records.
6. Personnel did not always follow checking and interdiscipline review requirements contained within procedures. The checking process described by the checklists (Review Topics) contained in QAP-3-8 and QAP-3-10 are not very clear to those who use them.

Action to Preclude Recurrence: All Items

1. A training session covering checking and interdiscipline reviews will be provided for all design personnel.
2. MGDS will request guidelines for the submittal of Federal records from the Records Management Organization. Appropriate procedures will be revised to incorporate instructions on how to process Federal records.
3. The M&O will review the current design control process, placing emphasis on improving the discipline checking and inter-discipline review steps. The design control process will be revised to move the discipline checking and interdiscipline reviews until after the 90% design review. The revised design control process will require that design inputs (analyses and the DIE) be

approved prior to the initiation of checking and interdiscipline reviews taking place. All designers will be trained to the revised process upon approval of necessary procedure revisions.

4. A review team will be established to review the checking process. Consideration will be made to document the actual checking process more formally by the use of checklists. MGDS management will be provided recommendations. The checking process will be revised accordingly. All designers will be trained to the revised checking process upon approval of necessary procedure revisions.
5. Direction has been provided that instructs the designers to submit all records to Engineering Document Control. See correspondence LV.ESSB.GH.7/94-691.

Responsible Individual: Alden Segrest  
Date of Completion: 1/31/95

 8/17/94

OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

8.  
CAR NO. YM-94-065  
PAGE 1 OF 1  
QA

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Partial Verification of CAR YM-94-065

1. Design products associated with early release (Phase I) were reviewed to verify that the check and interdiscipline reviews were accomplished and adequate. Design products reviewed are listed below:

Specification BAB000000-01717-6300-01014. Reviewed the following for this specification:

- Specification Review Summary
- Specification Check Copy
- Specification Inputs List Check Copy
- Specifications Checklist
- Specification In-Progress Copy

Note: Interdiscipline review not required per Specification Review Copy.

Analysis BABEAD000-01717-0200-00004, Requirements Allocation Analysis for North Ramp Excavation. Reviewed the following for this analysis:

- Design Analysis Review Summary
- Analysis Check Copy
- Interdiscipline Review Copy
- Design Analysis Checklist
- Analysis In-Progress Copy

Analysis BABEAD000-01717-0200-00003, North Ramp Layout Calculation. Reviewed the following for this analysis:

- Design Analysis Review Summary
- Analysis Check Copy
- Interdiscipline Review Copy
- Design Analysis Checklist
- Analysis In-Progress Copy

Drawing BABEAD000-01717-2100-40110. Reviewed the following for this drawing:

- Drawing Review Summary
- Drawing Check Copy
- Interdiscipline Review Copy
- Drawing Checklist
- Drawing In-Progress Copy

2. Reviewed CRWMS M&O Interoffice Correspondence, A. M. Segrest to MGDS Development Staff, dated 9/14/94, Subject : Retention of Design Document Check Copies. Correspondence addresses that check copies of design documents might not be QA records, however, they must be kept and submitted to the LRC as Federal Records.

  
Stephen R. Dana, QAR

9/21/94  
Date

**Interoffice Correspondence**  
Civilian Radioactive Waste Management System  
Management & Operating Contractor



TRW Environmental  
Safety Systems Inc.

WBS:1.2.6

QA: N/A

**Subject:**

Product review for CAR's  
94-QN-C-049, 94-QN-C-  
050, and YM-94-065  
(SCP:N/A)

**Date:**

December 7, 1994  
LV.ESSB.RMS.12/94-869

**From:** *RmStambaugh*  
R. M. Stambaugh

**To:**

R. Saunders, TES3/423

**cc:** w/attach

G. Heaney, TES3/423  
P. Jones, TES3/423  
LVRPC

**Location/Phone:**

TES3/530  
(702) 794-7001

w/o attach

M. DeLeon, TES3/423  
J. Naaf, TES3/423  
R. Saunders, TES3/423

A review was performed on "Issued For Construction" 2C package Q products to ensure that discipline and inter-discipline review comments were resolved. In summary, the following observations were made based on this review:

- 1) In most cases, discipline and interdiscipline review comments were found to be incorporated or adequately resolved.
- 2) A few isolated cases were identified where comment resolution was not clearly indicated. This was generally due to the product changing so substantially that it was near impossible to verify comment-by-comment resolution. Comment resolution in these cases were dispositioned on the product for clarity.
- 3) All other unresolved comments identified during the review were incorporated on the final product revision.
- 4) All Q "Issued For Construction" products were found to be complete; no records had been discarded or lost.

An investigation was conducted to ensure that the deficiencies identified in the subject CARs did not exist in other Q products prepared or revised by the M&O. The 1A package was the only other to contain Q products. This consisted of the following:

YMP-025-1-MING-MG-120 Rev 1 (\*)  
YMP-025-1-MING-MG-121 Rev 3  
YMP-025-1-MING-MG-122 Rev 2 (\*)  
YMP-025-1-MING-MG-123 Rev 4  
YMP-025-1-MING-MG-125 Rev 3  
YMP-025-1-MING-MG-128 Rev 3  
YMP-025-1-MING-MG-130 Rev 1 (\*)  
YMP-025-1-MING-MG-142 Rev 3 (\*)  
YMP-025-1-MING-MG-143 Rev 3  
YMP-025-1-MING-MG-151 Rev 1 (\*)  
YMP-025-1-MING-MG-152 Rev 1 (\*)  
YMP-025-1-MING-MG-153 Rev 1 (\*)  
YMP-025-1-MING-MG-154 Rev 1 (\*)  
YMP-025-1-MING-MG-160 Rev 0  
YMP-025-1-MING-MG-165 Rev 0

All discipline review comments were found to be adequately incorporated or resolved. The drawings with asterisks (\*) above did not have interdiscipline (ID) reviews. All other ID review comments were resolved adequately.

If you have any questions or concerns call me at 4-7001.

RMS:cam

Comment Resolution Review

Document Identifier	Comments Resolved Adequately	Reqd Clarification for Comment Resolution	Reqd Product Revision to Incorporate Unresolved Comments	Remarks
BABEAB000-01717-2100-41101 (Q)		X		
BABEAB000-01717-2100-41102 (Q)		X		
BABEAB000-01717-2100-41103 (Q)		X		
BABEAC000-01717-2100-41111 (Q)	X			
BABEAC000-01717-2100-41121 (Q)	X			
BABEAC000-01717-2100-41130 (Q)	X			
BABEAD000-01717-2100-40100 (Q)	X			
BABEAD000-01717-2100-40104 (Q)	X			
BABEAD000-01717-2100-40110 (Q)	X			
BABEAD000-01717-2100-40120 (Q)	X			

**Interoffice Correspondence**  
Civilian Radioactive Waste Management System  
Management & Operating Contractor



TRW Environmental  
Safety Systems Inc.

WBS: 1.2.6  
QA: Q/A

**Subject:**  
Specification BAB000000-01717-  
6300-01400 Rev. 02 Review  
History

**Date:**  
September 16, 1994  
LV.ESSB.RS.9/94-141

**From:**  
Roberta Stambaugh  
*R. Stambaugh*

**To:**  
File

**cc:**  
G. Heaney, TES3/423  
J. M. Taipale, TES3/423  
LVLRC

**Location/Phone:**  
TES3/530R  
(702) 794-7001

This IOC is to document the review history of the subject specification as part of corrective actions to CAR #YM-94-065.

Unlike other Package 2C documents, BAB000000-01717-6300-01400 Rev. 02 was not yet approved when the 2C package was withdrawn in August 1994. Because other 2C documents were approved and forwarded for baselining, it was necessary for them to go through the standard revision cycle. However, for the 01400 specification, various changes were made during the revision process that required sending it back through interdisciplinary (ID) review (i.e., DIE changes, impact from 2C package documents, etc.).

Therefore, that is the reason for the generation of four (4) separate Specification Review Summary records (dated between April to August 1994 - two of which were located in EDC).

Checker review copies for the three oldest reviews could not be located for verification of incorporation of comments. However, evidence that the checker was satisfied with comment incorporation is shown on the Specification Review Summary records. The "Check Copy" was retained for the latest review (8/26/94) and all comments were verified as being incorporated.

The ID review copies for reviews completed in April, May-June, and August were retained and comments verified to be incorporated. The ID review copy for reviews conducted July 7, 1994 could not be located. However, evidence that comments were incorporated to the reviewers' satisfaction is shown on the Specification Review Summary record.

RS:sas

Comment Resolution Review

Document Identifier	Comments Resolved Adequately	Reqd Clarification for Comment Resolution	Reqd Product Revision to Incorporate Unresolved Comments	Remarks
<u>Drawings</u>				
BABEAD000-01717-2100-40111 (Q)	X			
BABEAD000-01717-2100-40112 (Q)	X			
BABEAD000-01717-2100-40113 (Q)	X			
BABEAD000-01717-2100-40114 (Q)	X			
BABEAD000-01717-2100-40115 (Q)	X			
BABEAD000-01717-2100-40116 (Q)	X			
BABEAD000-01717-2100-40121 (Q)	X			
BABEAD000-01717-2100-40122 (Q)	X			
BABEAD000-01717-2100-40123 (Q)	X			
BABEAD000-01717-2100-40124 (Q)	X			
BABEAD000-01717-2100-40126 (Q)	X			
BABEAD000-01717-2100-40127 (Q)	X			
BABEAD000-01717-2100-40128 (Q)	X			
BABEAD000-01717-2100-40129 (Q)	X			
BABEAB000-01717-2100-40151 (Q)	X			
BABEAB000-01717-2100-40152 (Q)	X			
BABEAB000-01717-2100-40153 (Q)	X			
BABEAB000-01717-2100-40154 (Q)	X			
BABEAB000-01717-2100-40155 (Q)	X			
BABEAB000-01717-2100-40156 (Q)	X			
BABEAB000-01717-2100-40157 (Q)		X		
BABEAB000-01717-2100-40161 (Q)			X	
BABEAB000-01717-2100-40162 (Q)		X		
BABEAB000-01717-2100-40163 (Q)	X			See Ltr #768



**Interoffice Correspondence**  
Civilian Radioactive Waste Management System  
Management & Operating Contractor



TRW Environmental  
Safety Systems Inc.

**WBS: 1.2.6**  
**QA: QA**

**Subject:**  
Specification Checking  
Process  
(SCP:N/A)

**Date:**  
September 15, 1994  
LV.ESSB.RS.9/94-769

**From:**  
Roberta Stambaugh  
*RmStambaugh*

**To:**  
Distribution

**cc:**  
See Below  
LVLRC

**Location/Phone:**  
TES3/423  
(702) 794-5389

As part of the response to CAR # YM-94-065, an investigation was conducted to determine whether all checker and interdisciplinary reviewers comments were adequately incorporated into Specification BAB000000-01717-6300-01014 Rev 00. It was determined that no check was performed as required prior to interdisciplinary (ID) review. However, all ID reviewer comments were incorporated in Rev. 00. Since Rev. 00 was never issued, no adverse impact exists because a check was performed while preparing for Rev. 01 issuance.

**Distribution:**

G. Heaney, TES3/423  
J. L. Naaf, TES3/423  
D. J. Rogers, TES3/423  
R. S. Saunders, TES3/423  
J. M. Taipale, TES3/423

RS:cam

**Interoffice Correspondence**  
Civilian Radioactive Waste Management System  
Management & Operating Contractor



TRW Environmental  
Safety Systems Inc.

WBS: 1.2.6  
QA: N/A

**Subject:**  
Specification BABE0000-01717-  
6300-03363  
(SCP:N/A)

**Date:**  
September 22, 1994  
LV.ESSB.RMS.9/94-774

**From:**  
R. M. Stambaugh  
*R.M. Stambaugh*

**To:**  
File

**cc:**  
J. W. Keifer, TES3/423  
J. L. Naaf, TES3/423  
D. J. Rogers, TES3/423  
R. S. Saunders, TES3/423  
R. M. Stambaugh, TES3/423  
LVLRC

**Location/Phone:**  
TES3/530R  
(702) 794-7001

As part of corrective action to CAR # YM-94-065, a review was performed to verify incorporation or resolution of reviewer comments. The following was identified during the review.

The specification revision 0A (found in EDC) was the interdisciplinary (ID) review copy. Normally the "check print" copy of a specification is labelled 0A and per conversation with the originator, the "check print" copy was indeed marked 0A. However, the "check print" copy could not be located to verify resolution of checker comments. Per the originator, the ID review copy was not marked up to 0B.

All ID reviewer comments were verified to have been incorporated/resolved in the OC labelled "check print". Likewise, all OC reviewer comments were resolved prior to issuance of revision 00.

RMS:cam

**Interoffice Correspondence**  
Civilian Radioactive Waste Management System  
Management & Operating Contractor



TRW Environmental  
Safety Systems Inc.

WBS: 1.2.6  
QA: QA

**Subject:**  
Drawing Design Inputs  
Number Error  
(SCP:N/A)

**Date:**  
September 15, 1994  
LV.ESSB.RS.9/94-768

**From:**  
Roberta Stambaugh  
*Rmstambaugh*

**To:**  
Distribution

**cc:**  
See Below  
LVLRC

**Location/Phone:**  
TES3/423  
(702) 794-7001

As part of response to CAR # YM-94-065, corrective actions were to evaluate all back-up review documents (e.g., Check Copy, Interdiscipline Review Copy) to verify appropriate incorporation or resolution of reviewer comments.

Drawings marked as BABEAD000-01717-2100-40161-0A, 0B (13-APR-1994 07:34), 0B (13-APR-1994 10:48), 0D, and 00 were reviewed. On drawing revision 0B (CAD timed @ 7:34), the checker identified an error in the Design Input section. Specifically, TS North Ramp Rock Mass Classification BABEAB000-01717-0200-00004 should have been - 00005. The error was carried through to revision 00. This error will be corrected when revising the subject drawing to revision 01.

**Distribution:**

G. Heaney, TES3/423  
J. W. Keifer, TES3/423  
J. L. Naaf, TES3/423  
D. J. Rogers, TES3/423  
R. S. Saunders, TES3/423  
R. A. Skorseth, TES3/423

RS:cam

**Interoffice Correspondence**  
Civilian Radioactive Waste Management System  
Management & Operating Contractor



TRW Environmental  
Safety Systems Inc.

WBS:1.2.6  
QA: N/A

**Subject:**  
Completion of 2C Package  
Commitments  
(SCP:N/A)

**Date:**  
December 14, 1994  
LV:ESSB.RMS.12/94-877

**From:**  
R. M. Stambaugh  
*RmStambaugh*

**To:**  
See Below

**cc:**  
G. Heaney, TES3/423  
J. L. Naaf, TES3/423  
R. M. Stambaugh, TES3/423  
LVRPC

**Location/Phone:**  
TES3/530  
(702) 794-7001

In attached commitments (and support documentation if available) are being forwarded to you for completion of required actions. These tasks are being tracked by scheduled completion date. Please review these and advise me when tasks have been completed or if changes to the information are needed. We have tried to be thorough in our search of past commitments, but if you know of any additional ones - please let me know so that it can be properly tracked.

**Attachment**

- (1) Commitments
- (2) Support Documentation

**Distribution:**

L. R. Morrison, TES3/423  
J. H. Pye, TES3/423  
D. J. Rogers, TES3/423  
W. J. Reed, TES3/423  
R. S. Saunders, TES3/423  
M. Taylor, TES3/423  
J. M. Taipale, TES3/423

RMS:cam

12/20/94 LV:ESSB.GH.12/94-889

Assigned To

Task

Status

Estimated Completion

Assigned To	Task	Status	Estimated Completion
Rogers/Kennedy	Revise drawings 40120, 40104, 40100, & 40110 to incorporate QATSS QAP 6.2 comments from Package 2C (early release - see also QA portion of package 2C (2nd release))	Working	3/95
Reed	QAP 6.2 review comments by B. Verna on Package 2C 3a p. 8 of 8 to revise drawings 43040 & 43050	Will prepare FCR	2/95
Rogers/Jurani	Revise drawing BABFAD000-01717-2100-45601 to reflect matrix equivalent for note 2, delete note 6 and add ref. to note 1 "for package 2C excavation only."		6/95
Rogers/Jurani	Revising drug BABFAD000-01717-2100-45607 to reflect only one detailed elbow.		6/95
Rogers/Kennedy	Will add note to drawing 40116 on next revision.		3/95
Morrison	ESFDR Rev 1, App. B update. BFD will be revised to match appendix B after approval of ESFDR Rev. 1 Per package 1C revision comment 102.		1/95
Morrison	BFD requirement 7.6.1.8.D.5 to have two or more fire detection devices activate before alarm system activates will be re-evaluated when this BFD section is finalized Comment 2C 107.		1/95

Reed	Comment #2C 128 by the end of August 94 the new load flow data and list will be completed.		8/95
Taylor	QA affecting portion of package 2C (4th release) revise per comments #3, 4, 5, & 7 by W. Hunt; comments #6, 10, 11, 15 & 16 by M. Gomez; and comments #7, 13, 14, 15, 16, 18 & 23 by John Peters.		3/95
Pye	QA affecting portion of package 2C (4th release) revise per comment #28 by J. Peters.		1/95
Rogers/Jurani	QAP 6.2 review comments by B. Verna on package 2C3C to revise drawing 45608		6/95
Taylor/Becerra	QAP 6.2 review comments by B.Verna on package 2C3C to revise drawing 41152.		6/95
Pye	Revise BABEAB000-01717-0200-00010 to delete the callout for size of the steel sets per QA portion of package 2c (3rd release) comments #4 and #8 by J. Clark.		3/95
Rogers	Revise BABEAB000-01717-0200-00009 per QA Portion of Package 2C (3rd release) comment #5 by J. Clark.		3/95
Rogers	Generate a new analysis which documents the rationale for specific values selected in the following two (2) specifications: BABEAB000-01717-6300-03362 and -03363. See QA affecting portion of package 2C (5th release) revise per comments 8 & 21 by John Peters and # 5 & # 13 by M. Gomez.		3/95
Morrison	Update ESFDR ref. in 2C DIE BAB000000-01717-2200-0005 (3.2.1.1A, 3.2.2.1.J1)		1/95

Saunders	Comment # 2C 264 (Steve Dana). Design Process guidelines manual calls out need for Field Quality Control Section in all construction specs. This is not being done in all cases. A/E will review construction specs and add Field QC Section as necessary. Will develop a policy for constant application.		3/95
Saunders	The A/E will review all specs. for non QA entries contained in the QA section of specs. Non QA entries will either be separated into a new section or a subsection of the existing QA section with an annotation that clearly identifies the entries as non QA. Specification revisions will then be made by FCR. Comment 2C 93.		3/95
Taipa'e	Revise typo in FCR 94/141, Item 63 to read ST128	Need CR to fix	4/95
Taipale	Revise drawings and specs. to reflect revised DIE provisions regarding quantified limits. Need more specifics on amounts allowed.		Pending

### Design Verification Record (Continued)

WBS: 1.2.6  
 (13) QA: QA  
 Page: 2 Of: 2

4. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (2nd release)			15. DATE 09/22/94		
COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED	
1	General	<p>Add note to drawings stating that borehole information, geological information, and fault trace information is shown for reference purposes only and is neither a design input nor part of the design.</p>	<p>Agree to add the following note to the North Ramp layout drawings (Note will be added to future revisions of dwgs 40100, 40104, 40110, and 40120, which have already been approved):</p> <p>ANY BOREHOLE INFORMATION, GEOLOGICAL INFORMATION, OR FAULT TRACE INFORMATION SHOWN IS FOR REFERENCE PURPOSES ONLY AND IS NEITHER DESIGN INPUT OR PART OF THE DESIGN.</p>	<p style="font-size: 1.2em;">Accept                  JCA                  9-26-94</p>	
21. REVIEWED BY: Fredrick C. Arth <i>Fred Arth</i> <small>Print Name and Sign</small>		9-23-94 <small>Date</small>	22. RESPONSE BY: W.R. KENNEDY <i>W.R. Kennedy</i> <small>Print Name and Sign</small>		4-25-94 <small>Date</small>

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications Draft/Revision: N/A  Q  
 Document Number: N/A Governing Document: N/A Date: N/A  Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
1#	N/A - DRAWING	DRAWING BABEAD000-01717-40120, REV 01 - "NGR-2C" should be "NRG-2c" (REVIEW CRITERIA 2.7/3.11) (SEE ALSO YMA1102)	1. Agree -- The Department Manager and the QA Manager will initial and date this editorial correction on the drawing. 2. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.	Accept RJK 9/15/84
2#	N/A - DRAWING	DRAWING BABEAD000-01717-40120, REV 01 2100- THE SOURCE DOCUMENTS WHICH WERE USED TO DETERMINE THE LOCATIONS OF THE BOREHOLES SHOULD BE LISTED AS DESIGN INPUT ON THE DESIGN INPUT SHEET LIST (REVIEW CRITERIA 2.7/3.11) DATE 9/13/84	3. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.	Accept RJK 9/15/84
3#	N/A - DRAWING	DRAWING BABEAD000-01717-2100-40104, REV. 01 THE SOURCE DOCUMENTS WHICH WERE USED TO DETERMINE THE BORE HOLE PROJECTIONS SHOULD BE LISTED AS DESIGN INPUT ON THE DESIGN INPUT SHEET LIST DATE 9/13/84 (REVIEW CRITERIA 2.7/3.11)	3. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.	Accept RJK 9/15/84

5. Comments: Done by JMM Date: 9/13/84

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications Draft/Revision: N/A  O  
 Document Number: N/A Governing Document: N/A Date: N/A  Non O

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT												
9 #  S#	N/A - Drawing  N/A - Drawing	<p>DRAWING BABEAD000-01717-2100-40100, REV 01</p> <p>THE SOURCE DOCUMENTS WHICH WERE USED TO DETERMINE THE LOCATIONS, ELEVATIONS AND DEPTHS OF BOREHOLES SHOULD BE LISTED AS DESIGN INPUT ON THE DESIGN INPUTS LIST. (REVIEW CRITERIA 3.7/3.11)</p> <p>DRAWING BABEAD000-01717-2100-40110, REV 01</p> <p>CORRECT BOREHOLE NUMBERS AS FOLLOWS: (SEE ALSO CAR YM-94-062)</p> <table border="0"> <tr> <td>CHANGE</td> <td>TO</td> </tr> <tr> <td>NGR-2A</td> <td>NRG-2A</td> </tr> <tr> <td>NGR-2D</td> <td>NRG-2D</td> </tr> <tr> <td>NGR-2</td> <td>NRG-2</td> </tr> <tr> <td>NGR-2C</td> <td>NRG-2C</td> </tr> <tr> <td>NGR-2B</td> <td>NRG-2B</td> </tr> </table> <p>(REVIEW CRITERIA 3.7/3.11)</p>	CHANGE	TO	NGR-2A	NRG-2A	NGR-2D	NRG-2D	NGR-2	NRG-2	NGR-2C	NRG-2C	NGR-2B	NRG-2B	<p>4 Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESP Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.</p> <p>5 Agree -- The Department Manager and the QA Manager will initial and date this editorial correction on the drawing.</p>	<p>Accept RKH 9/15/94</p> <p>Accept RKH 9/15/94</p>
CHANGE	TO															
NGR-2A	NRG-2A															
NGR-2D	NRG-2D															
NGR-2	NRG-2															
NGR-2C	NRG-2C															
NGR-2B	NRG-2B															

8. Comments Daniel J. Wynn Date: 9/13/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications Draft/Revision: N/A  0  
 Document Number: N/A Governing Document: N/A Date: N/A  Non 0

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
67	N/A - DRAWING	<p><i>Doc</i>                      84754000-01767-2100-40110, 1200 -                      THE SOURCE DOCUMENTS WHICH WERE USED TO DETERMINE THE BOREHOLE LOCATION, DEPTH AND DIRECTION SHOULD BE LISTED A DESIGN INPUT ON THE DESIGN INPUT LIST. (REVIEW CRITERIA 3.7/3.11)</p>	<p>6a Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. <i>A note to this effect will be added to future revisions of this and similar drawings.</i></p>	<p>Accept  <i>RJH</i>                      9/15/94</p>
7	N/A	NO COMMENT	7. NO RESPONSE	<p>Accept  <i>RJH</i>                      9/15/94</p>

5. Comments David G. [Signature] Date: 9/13/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications

Draft/Revision: N/A

0

Document Number: N/A

Governing Document: N/A

Date: N/A

Non 0

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
8*		<p>BABAED000-01717-2100-40100-01 Notes 5 reference SNL Drawing No. 88-60-09 as the source for geologic and structural information. This drawing should be listed as a design input on the input list or in the North Ram Layout Calculation. Review Criteria 3.7 and 3.11</p>	<p>8. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESP Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.</p>	<p>Accept Rlt 9/15/84</p>
9*		<p>BABAED000-01717-2100-40100-01 Note 5 references USGS Open File Report 84-494 the source for fault trace locations. This report should be listed as a design input on the input list or in the North Ramp Layout Calculation. Review Criteria 3.7 and 3.11</p>	<p>9. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESP Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.</p>	<p>Accept Rlt 7/15/84</p>

5. Comments ROBERT HOWARD

Date: 9/14/84

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications

Draft/Revision: N/A

O

Document Number: N/A

Governing Document: N/A

Date: N/A

Non O

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	5. RESPONSE	7. ACCEPT
DX		<p>HABAED000-01717-2100-40100-01 Note 6 identifies the North Ramp as QA-1 and QA-2. The DTR for Package 2C identifies the North Ramp as QA-1, QA-2, and QA-5. Review criteria 3.6</p>	<p>10. Disagree -- This drawing only addresses that portion of the ESI' Package 2C' design that relates to the spatial positioning of the ramp. QA classifications governing this aspect of the design are identified in the DTR as being QA 1 and QA 2. The DTR identifies classification QA-5 as pertaining to permanent function ground support. This element of the design will be addressed in other 2C' design documents that are not included in this review but that are included in the attached list.</p>	<p>Accept Kelt 9/15/94</p>
11 K		<p>BABAED000-01717-2100-40104-01 Notes 5 reference SNL Drawing No. 88-60-09 as the source for geologic and structural information. This drawing should be listed as a design input on the input list or in the North Ramp Layout Calculation.</p>	<p>11. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESI' Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs List. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. <i>A note to this effect will be added to future revisions of this and similar drawings.</i></p>	<p>Accept Kelt 9/15/94</p>

8. Comments

ROBERT HOWARD

Date: 9/14/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications Draft/Revision: N/A  O  
 Document Number: N/A Governing Document: N/A Date: N/A  Non O

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
12 *		<p>BABAED000-01717-2100-40104-01 Notes 5 &amp; 6 reference SNL Drawing No. 88-60-09 as the source for geologic and structural information. This drawing should be listed as a design input on the input list or in the North Ram Layout Calculation. Review Criteria 3.7 and 3.11</p>	<p>12. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to this and similar drawings. future revisions of</p>	<p>accept R/H 9/15/84</p>
13 *		<p>BABAED000-01717-2100-40104-01 Note 6 references USGS Open File Report 84-494 the source for fault trace locations. This report should be listed as a design input on the input list or in the North Ramp Layout Calculation. Review Criteria 3.7 and 3.11</p>	<p>B. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.</p>	<p>accept R/H 9/15/84</p>

8. Comments ROBERT HOWARD Date: 9/14/84

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications Draft/Revision: N/A  Q  
 Document Number: N/A Governing Document: N/A Date: N/A  Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
14 *		<p>BABAED000-01717-2100-40110-01 Note 9 identifies the North Ramp as QA-1 and QA-2. The DIE for Package 2C identifies the North Ramp as QA-1, QA-2, and QA-5. Review criteria 3.6</p>	<p>14. Disagree -- This drawing only addresses that portion of the ESF Package 2C design that relates to the spatial positioning of the ramp. QA classifications governing this aspect of the design are identified in the DIE as being QA-1 and QA-2. The DIE identifies classification QA-5 as pertaining to permanent function ground support. This element of the design will be addressed in other 2C design documents that are not included in this review but that are included in the attached list.</p>	<p>Accept KLB 9/5/94</p>
15 *		<p>BABAED000-01717-2100-40110-01 Note 4 references SNL Drawing No. 88-60-09 as the source for geologic and structural information. This drawing should be listed as a design input on the inputs lists or in the North Ramp Layout Calculation. Review Criteria 3.7 and 3.11</p>	<p>15. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.</p>	<p>Accept KLB 9/15/94</p>

5. Comments ROBERT HOWARD Date: 9/14/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications Draft/Revision: N/A  0  
 Document Number: N/A Governing Document: N/A Date: N/A  Non 0

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
16 *		BABAED000-01717-2100-40120-01 Note 8 identifies the North Ramp as QA-1 and QA-2. The DIE for Package 2C identifies the North Ramp as QA-1, QA-2, and QA-5. Review criteria 3.6	K. Disagree -- This drawing only addresses that portion of the ESP Package 2C design that relates to the spatial positioning of the ramp. QA classifications governing this aspect of the design are identified in the DIE as being QA-1 and QA-2. The DIE identifies classification QA-5 as pertaining to permanent function ground support. This element of the design will be addressed in other 2C design documents that are not included in this review but that are included in the attached list.	Accept RLB 9/15/94
17 *		BABAED000-01717-2100-40120-01 Note 5 references SNL Drawing No. 88-60-09 as the source for geologic and structural information. This drawing should be listed as a design input on the input list or in the North Ram Layout Calculation. Review Criteria 3.7 and 3.11	R. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESP Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings	Accept RLB 9/15/94

5. Comments ROBERT HOWARD Date: 9/14/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C - Drawings and Specifications

Draft/Revision: N/A

Q

Document Number: N/A

Governing Document: N/A

Date: N/A

Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
18*		<p>BABAED000-01717-2100-40120-01 Note 5 references USGS Open File Report 84-494 the source for fault trace locations. This report should be listed as a design input on the input list or in the North Ram Layout Calculation. Review Criteria 3.7 and 3.11</p>	<p>18. Disagree -- The geological information shown and referenced by the note on the drawing was not used as design input. The ESF Package 2C North Ramp layout design was developed using the design inputs that are included on the Inputs Lists. Refer to Input No.1 for very explicit definition of geologic information that was used in developing the design. The geological information shown and referenced by the note on the drawing is not part of the design; it is provided as reference information only. A note to this effect will be added to future revisions of this and similar drawings.</p>	<p>Accept RPH 9/15/94</p>
19*		<p>BABAED000-01717-2100-40104-01 Note 10 identifies the North Ramp as QA-1 and QA-2. The DIE for Package 2C identifies the North Ramp as QA-1, QA-2, and QA-5. Review criteria 3.6</p>	<p>19. Disagree -- This drawing only addresses that portion of the ESF Package 2C design that relates to the spatial positioning of the ramp. QA classifications governing this aspect of the design are identified in the DIE as being QA-1 and QA-2. The DIE identifies classification QA-5 as pertaining to permanent function ground support. This element of the design will be addressed in other 2C design documents that are not included in this review but that are included in the attached list.</p>	<p>Accept RPH 9/15/94</p>

5. Comments ROBERT HOWARD

Date: 9/14/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C3 (part a) - Drawings and Specifications Draft/Revision: See Page 2, 3, 4 of DAR  O  
 Document Number: See Page 2, 3, 4 of DAR 1189 Governing Document: N/A Date: \_\_\_\_\_  Non O

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
	DWG 43030	TO HELP LOCATING THE UTILITIES SHOWN IN THIS DRAWING THE SURVEY STATION SHOULD BE MARKED AT MATCH LINE	1. THE MATCH LINE IS NOT AT STATION 00+00 AS SHOWN ON DWG 43031. THE INSTRUMENTATION IN THIS AREA IS SHOWN ON DWG. 43050 DETAIL. W. REGD 10/12/94.	ACCEPT JAG/AV 10/12/94
	DWG 43040	SHOW STATION FOR ALCOVE LOCATION	2. AGREE WILL ADD AT NEXT REVISION TO DRAWING. W. REGD 10/12/94 INFORMATION WILL BE INDICATED AS BUILT TO BE ADDED AT NEXT REVISION. (u)	ACCEPT JAG/AV 10/12/94
	DWG 43050	SHOW LOCATION WHERE DETAIL 3 WILL BE INSTALLED	3. DETAIL 3 IS NOT USED AT THIS TIME. W. REGD 10/12/94. DETAIL WILL BE INDICATED ON AS-BUILT TO BE REMOVED ON NEXT REVISION. (u)	ACCEPT JAG/AV 10/12/94
	DWG 44010	STATIONS DO NOT SEEM TO MATCH LAYOUT FOR EACH OF NORTH RAMP	4. STATION NUMBERS WERE VERIFIED AGAINST EXCAVATION DRAWINGS AND DETERMINED TO BE CORRECT. W. REGD 10/12/94	ACCEPT JAG/AV 10/12/94
	SEVERAL DWGS	DWGS # 44024 AND # 44032 THRU 44034 SEEM TO BE MISSING FROM THIS PACKAGE	5. DRAWINGS WERE MISSING FROM ORIGINAL SUBMITTAL AND WILL BE INCLUDED IN NEXT SUBMITTAL. W. REGD 10/12/94	ACCEPT JAG/AV 10/12/94
	DWGS 45301 45302 45303	IT IS NOT VERY CLEAR WHICH ARE THE LOCATIONS FOR THESE UTILITIES	6. LOCATIONS ARE GIVEN AS NOTES TO INSTALL EVERY 60 METERS ETC. THIS IS DONE TO PROVIDE THE CONSTRUCTOR WITH THE FLEXIBILITY HE NEEDS TO PROCEED IN AN EXPEDITIOUS MANNER.	ACCEPT JAG/AV 10/12/94

5. Comments B.J. Verna Date: 10/5/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C2 (part a) - Drawings - See page 2 of DAR

Draft/Revision: N/A

Q

Document Number: See page 2 of DAR

Governing Document: N/A

Date: N/A

Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
1.	General	The notes section of every drawing contains a delta mark that does not identify the changed portion or is superfluous.	IN ACCORDANCE WITH GAP-3-10/REV 04, TP 5.11.5, "REVISION SCHEDULES OR NOTES MAY OMIT CLOUDS BUT REVISION DELTAS MUST BE PLACED ADJACENT TO THE REVISED SCHEDULE OR NOTE." NO CHANGE REQUIRED.	Accept R/V 10/6/94
2.4	40116	This drawing is the only one out of this series that does not have the notes listed on it. To keep consistency suggest that the notes be added to this drawing.	AGREE TO ADD NOTES TO <del>DWG 40116</del> WHEN THE DWG <del>IS REVISED</del> WPK 10-05-94 THE NEXT REVISION OF DWG 40116, ADD TO PRIORITIZED TASK LISTING MOL 10.6.94	Accept R/V 10/6/94

5. Comments J. m. Replogle

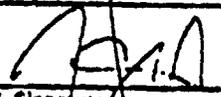
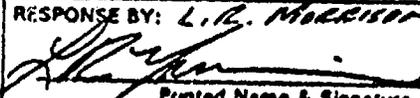
Date: 9/30/94

# 90% Design Review - Design Package 2C

CRWMS/M&O

## Document Review Record (Continued)

WBS: 12.6  
QA: QA  
Page: 12 of 40

DOCUMENT TITLE		REVISION	DATE	DOCUMENT IDENTIFIER
MINING ANALYSIS Vol 1		03	5-2-94	B7BF A002-01717-0200-00001
COMMENT NO.	SECTION/ PARAGRAPH	COMMENTS	RESPONSE	ACCEPT/ REJECT
1	11/11.3 p 15	<input checked="" type="checkbox"/> Mandatory - Requirement # <u>N/A</u> <input type="checkbox"/> Non-Mandatory (No Response Required) It appears that the design input is a pass through from TCO to the A/E. ESFDR Appendix B is suppose to convey design needs of the PI's. Using direct pass through could make it difficult to trace the design input for test. This could create a traceability problem and may raise some concern. Why not develop approach that allows changes to ESPDR Appendix B as means to transmit PI facility requirements.	2C - 102 L.R. MORRISON WE ARE CURRENTLY ATTEMPTING TO IMPLEMENT THE PROCEDURE YOU SUGGEST. THE SYSTEMS REQUIREMENTS PEOPLE (SAM RINDSKOPF) ARE ISSUING A REQUEST TO THE TCO TO UPDATE APPENDIX B OF THE ESFDR. WHEN THE ESFDR IS REVISED, THE BFD WILL BE UPDATED AS REQUIRED TO MATCH. HOWEVER, AS ESFDR APPENDIX B IS NOT CURRENTLY UP-TO-DATE WE FEEL IT IS PROPER TO USE TCO LETTERS DIRECTLY TO INSURE INCORPORATION OF TCO REQUIREMENTS UNTIL THE BFD IS UPDATED. THIS PROCEDURE WILL LIKELY BE FOLLOWED IN THE NEAR FUTURE AS IT IS UNLIKELY THAT REVISIONS TO THE ESFDR CAN BE MADE IN THE VERY SHORT TIME REQUIRED TO SUPPORT BFD AND DESIGN PACKAGE SCHEDULES.	Accept JAG 6/16/94
REVIEWED BY: Jaime Gonzalez  <small>Printed Name &amp; Signature</small>		5/2/94 <small>Date</small>	RESPONSE BY: L.R. MORRISON  <small>Printed Name &amp; Signature</small>	
		5-26-94 <small>Date</small>		

2C  
102

HNK

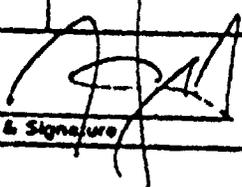
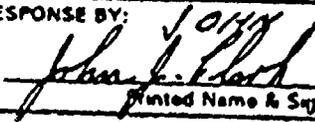
Document Review Record  
(Continued)

WBS: 126  
QA: QA  
Page: 17 Of: 40

RWMS/M&O  
OSM  
needs  
LRA

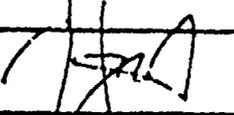
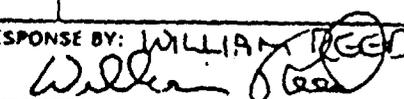
DOCUMENT TITLE <b>BFD</b>	REVISION <b>D4</b>	DATE <b>5/2/94</b>	DOCUMENT IDENTIFIER <b>01717 - 6300 - 00002</b>
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COMMENT NO.	SECTION/ PARAGRAPH	COMMENTS	RESPONSE	ACCEPT/ REJECT
<b>2C 107</b>	<b>D3 PAGE 7-356</b>	<input checked="" type="checkbox"/> Mandatory - Requirement # <u>N/A</u> <input type="checkbox"/> Non-Mandatory (No Response Required)  It is stated in the BFD that the fire alarm system should be activated only after two or more indications of detection devices (BFD D3 page 7-356). This is not a correct approach to take in order to minimize false alarms. It should be done in a statistical manner using confidence limits to set appropriate alarm levels to reduce false alarms to a statistically satisfactory level. To arbitrarily require at least two alarms before any action is taken could well result in a real alarm being ignored with the associated consequences of such an action.	THIS WILL BE REVISITED AND THE CRITERIA CHANGED IF WARRANTED	ACCEPT JAG 6/13/94

REVIEWED BY: <b>Jaime A. Gonzalez</b> <small>Printed Name &amp; Signature</small>	 <b>5/20/94</b> <small>Date</small>	RESPONSE BY: <b>JOHN J. CLARK</b>  <small>Printed Name &amp; Signature</small>	<b>5-27-94</b> <small>Date</small>
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0423-1 PM.

Document Review Record  
(Continued)

DOCUMENT TITLE		REVISION	DATE	DOCUMENT IDENTIFIER
ELECTRICAL ANALYSIS — 90% REVIEW PACKAGE 2C		0B	05-16-94	BABFAA000-01717-0200-00001
COMMENT NO.	SECTION/ PARAGRAPH	COMMENTS	RESPONSE	ACCEPT/ REJECT
2C 128	GENERAL	<p>WHERE ARE THE <sup>UPDATED</sup> LOAD FLOW ANALYSIS ETC, WHICH I BELIEVE SHOULD BE PART OF THE <del>ANALYSIS</del> PACKAGE. THIS COMMENT IS RELEVANT TO SECTION 9 ON PAGE 4 OF 7. (MANDATORY)</p>	<p>THE M&amp;D IS IN THE PROCESS OF UPDATING THE PROJECT LOAD FLOW DATA INTO A COMPUTER SOFTWARE PROGRAM CALLED ETAP. ONCE THIS UPDATE HAS BGGW COMPLETED REVISED LOAD FLOW DATA WILL BE AVAILABLE.</p>	<p>Accept JAG 6/1/94</p>
REVIEWED BY:		RESPONSE BY:		
Jaime Gonzalez		WILLIAM REED		
				
Printed Name & Signature		Printed Name & Signature		
Date		Date		
4/20/94		5/23/94		

4. DESIGN PACKAGE TITLE

Quality Affecting Portion of Package 2C (4th release)

15. DATE  
10/14/94

6. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
3	SPEC. 02341 STEEL SETS AND NECESSARIES SUBSURFACE SPECIFICATION SECTION: 2.01 PAR.: A, B, C	There is no evidence of backup supporting documentation (calculations or analysis) for the materials specified for the components in Sections 2.01 A. 1.- 7., 2.01 B., 2.01 B. 1., and 2.01 C.	This will be included in the next revision of the analysis. <del>10-27-94</del> 10-27-94 (the steel set analysis)	ACCEPT JH 10-27-94

B  
10-27-94

21. REVIEWED BY:  
 William Hunt William Hunt 10-25-94  
Print Name and Sign Date

22. RESPONSE BY:  
E.M. JEDENIK 10/27/94  
Print Name and Sign Date



TRW Environmental  
Safety Systems Inc.

101 Convention Center Drive, P110  
Las Vegas, NV 89109  
702.794.1800

WBS 1.2.6  
QA: N/A

Contract #: DE-AC01-91RW00134  
LV.ESSB.GH.12/94-250

**QA RECEIVED**

December 20, 1994

DEC 27 1994

Mr. Robert M. Nelson, Jr.  
Acting Project Manager  
Yucca Mountain Site Characterization Project  
U. S. Department of Energy  
P. O. Box 98608  
Las Vegas, Nevada 89139-8608

Attention: R. E. Spence

Dear Mr. Nelson:

Subject: Amended Response to CAR YM-94-065 (SCP: N/A)

We are amending portions of our original response to the subject CAR. The following amendment is required as a result of our review of the current design control process. We have decided that the discipline checking and inter-discipline reviews do not necessarily have to be performed after the 90% design review. Discipline and inter-discipline review steps are to be performed after all design inputs (i.e. analyses, DIES etc.) are approved.

#### Root Cause

Revise Item No. 3 to read, "The checking process (and interdiscipline review) in the current Design Control Process precedes the 90% Design Review. Many discrepancies being identified indicate they are a result of incorporating 90% design review comments. Additionally, design inputs were being generated in parallel with design specifications and drawings."

#### Action to Preclude Recurrence

Revise to read, "The M&O is reviewing and revising the current design control process to incorporate lessons learned from the various audits and surveillance which have just concluded. Emphasis is being placed on improving the discipline and inter-discipline review steps. The revised design control process will require that design inputs (analyses and the DIE) be approved prior to the initiation of checking and interdiscipline reviews taking place. All designers will be trained to the revised process upon approval of necessary procedure revisions. Until the process is formally changed, we will follow the process outlined in the procedures."

LV.ESSB.GH.12/94-250

Dcember 20, 1994

Page2

If you have any questions, please contact Alden Segrest at 794-1924.

Sincerely,



L. Dale Foust  
Assistants General Manager, Nevada Site  
Technical Project Officer

cc:

G. S. Abend, M&O, Las Vegas, NV  
G. Heaney, M&O, Las Vegas, NV  
P. G. Jones, M&O, Las Vegas, NV  
J. L. Naaf, M&O, Las Vegas, NV  
R. P. Ruth, M&O, Las Vegas, NV  
R. M. Sandifer, M&O, Las Vegas, NV  
R. S. Saunders, M&O, Las Vegas, NV  
A. M. Segrest, M&O, Las Vegas, NV  
R. E. Spence, YMSCO, Las Vegas, NV  
D. Sult, QATSS, Las Vegas, NV  
Project File No. 102.01.1  
RPC

LDF:GH:sas

OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

PAGE \_\_\_\_\_ OF \_\_\_\_\_  
CA

**CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)**

EVALUATION OF AMENDED RESPONSE TO CARS YM-94-065 AND YM-94-072

On December 27, the Office of Quality Assurance received the following letters from the M&O:

1. LV.ESSB.GH.12/94-889 dated December 20, 1994 from L. Dale Foust to Robert M. Nelson, Jr.
2. LV.ESSB.GH.12/94-890 dated December 20, 1994 from L. Dale Foust to Robert M. Nelson, Jr.
3. LV.ESSB.GH.12/94-250 dated December 20, 1994 from L. Dale Foust to Robert M. Nelson, Jr.

Letters LV.ESSB.GH.12/94-889 and LV.ESSB.GH.12/94-890 dated December 20, 1994 from L. Dale Foust to Robert M. Nelson, Jr. state that during the verification and QAP 6.2 review of several design package 2C products, review comments were made that indicate additional extent of deficiency identified in CAR YM-94-065 and YM-94-072. These letters also state that these deficiencies are being tracked via letter LV.ESSB.RMS.12/94-877 and that revisions are necessary to supporting analyses. Letter LV.ESSB.GH.12/94-250 revises the root cause and actions to preclude recurrence indicating that changes are being made to the design control process. Based on this supplemental information, YMQAD needs further clarification to adequately evaluate corrective actions for CARS YM-94-065 and YM-94-072.

1. Letters LV.ESSB.GH.12/94-889 and LV.ESSB.GH.12/94-890 state that the revisions will be completed by February 6, 1995. However, letter LV.ESSB.RMS.12/94-877 indicates that revision of some analyses will not be complete until March 1995. It is unclear what exactly the M&O considers the extent of deficiency for analyses and what the final completion date is for these additional corrective actions.
2. CAR YM-94-065 identifies deficiencies not only related to analyses, but also to drawings and specifications. The M&O committed to rechecking and correcting all Design Package 2C products. Letter LV.ESSB.RMS.12/94-877 identifies several specifications and drawings that need to be revised. Does the M&O consider these items as part of the extent of the deficiency of CAR YM-94-065?

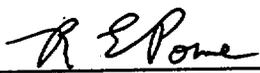
OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

8 CAR NO. \_\_\_\_\_  
PAGE \_\_\_\_\_ OF \_\_\_\_\_  
QA

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

3. Letter LV.ESSB.GH.12/94-250 provides an amended response to CAR YM-94-065 but does not provide any due dates for the proposed actions or ask for an extension. The corrective action due dates on the CAR indicate completion by 1/31/95. This appears to be inconsistent with the information provided in M&O letter LV.ESSB.RMS.12/94-877 and M&O letter LV.ESSB.GH.12/94-889.
4. The amended response includes a new completion date of March 15, 1995; does the M&O need an extension for completion of corrective action until this date?

Please provide the additional information within 10 working days. If you have any questions please contact Richard Powe at 794-7749.

  
\_\_\_\_\_  
Richard E. Powe

1/10/95  
\_\_\_\_\_  
Date

## Review Comments Associated With CAR YM-94-065

Comment No.	Assigned To	Task	Status	Estimated Completion
12	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
13	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
14	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
16	Taylor	Revise material dedication analysis for clarification.		2/24/95
15	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
19	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
20	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
21	Taylor	Revise steel set analysis. A deficiency related to CAR YM-94-065.		2/24/95
23	Taylor/ Becerra	2 BCPs to revise dimensions on dwgs 45608 and 41152 to all metric. Checking should pick-up for consistency.		3/31/95
27	Rogers	New analysis to be prepared. CAR YM-94-065 deficiency.		3/31/95
28	Rogers	New analysis to be prepared. CAR YM-94-065 deficiency.		3/31/95
29	Rogers	New analysis to be prepared. CAR YM-94-065 deficiency.		3/31/95
30	Rogers	New analysis to be prepared. CAR YM-94-065 deficiency.		3/31/95
36	Rogers	Explain origin of equation CAR YM-94-065 deficiency.		2/24/95

1/31/95 SB/LS  
 LV. ESSB. GH. 01/95 - 515

12

### Design Verification Record (Continued)

RWMS/M&O

WBS: 126  
QA: QA  
Page: 11 of 17

4. DESIGN PACKAGE TITLE  
Quality Affecting Portion of Package 2C (4th release) 15. DATE  
10/14/94

6. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
10	BABEA000 -01717-6300 -02341 3.03.A.1	Horizontal offset of 215mm exceeds the 210mm computed sum of maximum tolerances as shown in Structural Steel Sets Analysis Attachment V page V-3. Statement in analysis should also be revised to reflect 210mm.	Agree, next revision of the Steel Set Analysis will incorporate this adjustment	ACCEPT MJD 10/27/94

21. REVIEWED BY:  
Matthew J. Gomez *[Signature]* 10/25/94  
Print Name and Sign Date

22. RESPONSE BY:  
E.M. *[Signature]* 10/27/94  
Print Name and Sign Date

13

WMS/M&O

### Design Verification Record (Continued)

WBS: 1.2.6  
QA: QA  
Page: 12 of 17

DESIGN PACKAGE TITLE			15. DATE
Quality Affecting Portion of Package 2C (4th release)			10/14/94
11. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE
11	BABEAB000 -01717-6300 -02341  3.03.B.1	1219mm (4 ft) spacing should be a QA Control since it effects maximum loading on the steel sets.  This is a spacing, not a tolerance as stated.	Agree, a $\pm 2$ inch tolerance added. The next revision of the steel set analysis will incorporate the tolerance. At present there is sufficient reserve in the analysis to accommodate a 4% increase in stress levels
			20. ACCEPTED M 10/27/94

21. REVIEWED BY:

Matthew J. Gurnea

10/27/94

Date

22. RESPONSE BY:

R.M. JEDEN

10/27/94

Date

14

RWMS/M&O

### Design Verification Record (Continued)

WBS: 126

13

QA: QA

Page: 16 of 17

14. DESIGN PACKAGE TITLE

Quality Affecting Portion of Package 2C (4th release)

15. DATE

10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
15	BABEAB000-01717-2100-41102 General	<p>Sections and Details do not match Structural Steel Set Analysis BABEAB000-01717-0201-00102 as follows:</p> <p><b>SECTION B</b> Page III-41 shows a 3" slot.</p> <p><b>SECTION C</b> Page III-34 shows a 15/16" diameter hole. Page III-34 shows a 1 1/2" dimension from c.l. of bolt to c.l. of beam.</p> <p><b>DETAIL 2</b> Page III-43 shows a 2" wedge flange width. Also since this is tapered, dimension should say VARIES (2" MAX).</p> <p><b>VIEW D</b> Page III-6 shows an 8" long clip plate. No design found for 3/8" x 4" Sq plate.</p>	<p>The next revision of the steel set analysis and drawings will incorporate these comments.</p> <p>Section B - drawing correct, analysis to be corrected</p> <p>Section C - drawing correct, analysis to be corrected</p> <p>Detail 2 - analysis correct, drawing to be corrected</p> <p>View D - drawing correct, <del>analysis</del> <sup>analysis</sup> to be corrected.</p>	<p>ACCEPT MD 10/28/94</p>

21. REVIEWED BY:

Matthew J Gomez

*Matthew J Gomez*  
10/26/94

22. RESPONSE BY

E.M. FEDEN

*E.M. Feden*  
10/27/94

15

RWMS/M&O

# Design Verification Record (Continued)

WBS: 126  
QA: QA  
Page: 17 of 17

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4. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (4th release)			15. DATE 10/14/94	
6. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
16	BABEAB000-01717-2100-41103 General	<p>Sections and Details do not match Structural Steel Set Analysis BABEAB000-01717-0200-00002 as follows:</p> <p><b>DETAIL 1</b> Section 11.6 of conclusions &amp; Page III-23 call for 3/4" x 8" x 1"-01/2" plate.</p> <p><b>VIEW A</b> Page III-17 calls for 3" to the first bolt. Page III-17 calls for 2 1/2" dimension from c.l. of bolt to c.l. of beam. Page III-16 &amp; III-17 show top line of holes in WB as alternate location of Jacking Bracket. Page III-22 shows edge of plate at 6 1/2" from c.l. of beam. Page III-37 shows 2 1/2" dimension from c.l. of bolt to c.l. of beam at slotted holes.</p> <p><b>DETAIL 2</b> Page III-16 shows a 1/2" end plate on of Jacking Bracket. Page III-17 shows 2" dimension for location of slotted holes.</p> <p><b>VIEW B</b> Page III-17 calls for 9/16 x 1 1/4" slotted hole. Page III-17 shows 3" dimension from c.l. of bolt to c.l. of beam at slotted holes. Page III-17 calls for 2 1/2" dimension from c.l. of bolt to c.l. of beam. Page III-16 shows a 1/2" plate along c.l. Page III-16 shows a 1/2" end plate on of Jacking Bracket.</p>	<p>AFTER REVIEW OF THE DRAWINGS AND ANALYSIS, THE DRAWINGS ARE CORRECT. THE SKETCHES IN THE ANALYSIS WERE A STARTING POINT FOR THE DRAWINGS. WITH THE NEXT REVISION OF THE ANALYSIS THE SKETCHES WILL BE UPDATED TO MATCH THE CORRECT INFORMATION OF THE DRAWING</p>	<p>ACCEPTED MJD 10/28/94</p>
21. REVIEWED BY: Matthew J Gomez <i>[Signature]</i> 10/28/94 Print Name and Sign Date		22. RESPONSE BY: E. M. JEDEN <i>[Signature]</i> 10/28/94 Print Name and Sign Date		

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CRWMS/M&O

# Design Verification Record (Continued)

WBS: 1.2.6

QA: QA

13

Page: 44 of 53

14. DESIGN PACKAGE TITLE		15. DATE	16. DATE
Quality Affixing Portion of Package 2C (4th release)		10/14/94	10/27/94
16. COMMENT NO.	17. DOCUMENT SECTION PARAGRAPH	18. COMMENTS	19. RESPONSE
13	BASE R8CND-01717-0200-00003	<p>XXXXXXXX-0171-0200-00003 R-1 MATERIAL VERIFICATION ANALYSIS FOR COMMERCIAL GRADE ITEM-STEEL SETS</p> <p>This analysis states that "the items analyzed in this document are steel sets and accessories used in the 75 mesh trap ground support". This analysis hinges on the premise that items procured as "commercial grade" are to be dedicated and provided, the inspection and test methodology for doing this "by definition an 'engineered item' cannot be 'commercial grade'. However a review of the NBO steel set procurement drawings discloses that the steel sets are 'engineered items'. Per the QAB definition Commercial Grade items are those "not subject to design or specification criteria unique to the program or nuclear facilities; used in applications other than the nuclear industry, and ordered from the manufacturer or supplier on the basis of specifications set forth in the manufacturer's published product description." As such while steel set components may in fact be procured as commercial grade and dedicated to the site, fabricated steel sets to the NBO drawings must be procured from a qualified supplier in accordance with QAB requirements and have nothing to do with commercial grade dedication. This analysis fails to make this distinction and infers that the steel sets are procured as commercial grade.. They are not.</p>	<p>THE MATERIALS DEDICATION ANALYSIS BASE R8CND-01717-0200-00003 REV03, WILL BE REVISED TO REFLECT:</p> <ol style="list-style-type: none"> <li>1. STEEL SETS ARE AN ENGINEERED ITEM, BUT THAT COMPONENTS ARE OF STEEL SETS WHICH MEET PURCHASED AS COMMERCIAL GRADE ITEMS WHICH MEET QAB DEFINITION</li> <li>2. PURPOSE OF THE ANALYSIS IS TO ESTABLISH CRITICAL AND FUNCTIONAL CHARACTERISTICS OF THE STEEL.</li> <li>3. INSPECTION AND TESTS IDENTIFIED IN THE ANALYSIS MAY BE USED TO ENSURE THE CRITICAL AND FUNCTIONAL CHARACTERISTICS.</li> </ol>
21. REVIEWED BY:		22. RESPONSE BY:	
John W. Myers		John H. Pyle	
10/26/94		10/27/94	

19

VMS/M&O

### Design Verification Record (Continued)

WBS: 126  
QA: QA  
Page: 17 of 33

DESIGN PACKAGE TITLE: Utility Affecting Portion of Package 2C (4th release)  
15. DATE: 10/14/94

COMMENT NO.	DOCUMENT SECTION/ PARAGRAPH	COMMENTS	19. RESPONSE	20. ACCEPTED
16	BARE/800 - 0717-0200 - 00002	Structural Steel Deck Analysis Bl 9 subsequence-01717-0200-00002 Rev 0 Attachment 1, Page 1-31. Equations for determining the horizontal and vertical components of the jacking force are incorrect. $P_x = P_y \sin \theta$ should be $P_x = P_y \cos \theta$ and $P_y = P_x \sin \theta$ should be $P_y = P_x \cos \theta$ . This impacts the jacking load analysis and possibly some of the subsequent structural analysis. (MS)	ACCEPT.	ACCEPTED <i>accept JSD 11/27/94</i>

21. REVIEWED BY: John W. Peters *JWP* 10/16/94

22. RESPONSE BY: JOHN H. PYLE *John H. Pyle* 10/29/94

20

WMS/M&O

# Design Verification Record (Continued)

WBS: 1.26

13

QA: QA

Page: 19 of 33

DESIGN PACKAGE TITLE

Utility Affecting Portion of Package 2C (4th release)

15. DATE

10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
18	BABEN8000-01717-0200-00002	Structural Steel Size Analysis of BABEN8000-01717-0200-00002 Rev 04 Attachment II, Page 1-3. Assumptions 1 and 2 at the bottom of the page need to be identified in Section 7 "Assumptions" of the Cont. (MS)	Assumption 1 is an input not an assumption. <del>Assumption 2</del> Assumption 2 is an assumption and will be listed in Section 7 Assumption when the analysis is next revised.	accept 10/27/94

21. REVIEWED BY:

John W. Peters

10/26/94

22. RESPONSE BY:

E.M. Geden

10/27/94

WMSM&O

(21)

# Design Verification Record (Continued)

WBS: 126

(13)

QA: QA  
Page: 24 of 35

15. DATE  
10/14/94

DESIGN PACKAGE TITLE

Utility Affixing Portion of Package 2C (4th release)

17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
23 BASE/800-04717-0200-0000X	Structural Steel Gate Analysis D1 & paragraphs 01717-0200-0000X per Attachment IV, Page IV-5. The assumption that the steel gate loading R will be equal to 0.25R leads to the identification in Section 7 "assumptions" of the cont. (19)	ACCEPT. WILL CITE AS AN ASSUMPTION IN SECTION 7 OF THE ANALYSIS WHEN REVISED.	Accepted 10/16/94

21. REVIEWED BY:

John W. Rivers

*[Signature]*

10/26/94

22. RESPONSE BY:

John H. Pyle

*[Signature]*

10/27/94

23

YMP-110-R3  
06/20/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

Page \_\_\_\_\_ of \_\_\_\_\_

1. Document Title: Package 2C3 (part c) - Drawings & Specification Draft/Revision: N/A  Q  
Document Number: N/A Governing Document: N/A Date: N/A  Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
1. ✕	45608 41152	These dwgs have a mix of metric and english dimensions that should be all metric. Dwg 45609 is a dwg of similar components, which is done all in metric. Suggest that at the next revision A/E change all relevant dimensions to metric.	Agree  10-13-94	Accept BAC 10/13/94

5. Comments B. J. Verma Date: 10/13/94

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Design Verification Record  
(Continued)

WBS: 1.2.6

13. QA: QA

Page: 2 Of 42

14. DESIGN PACKAGE TITLE			15. DATE	
Quality Affecting Portion of Package 2C (5th Release)			10/31/94	
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
1	BABEAB000-01717-6300-02344-201/1/14 General 03263	An analysis should be prepared to document the values and engineering decisions used in this specification which are not documented in the already cited analyses. Examples are: 2.01 B. ASTM C150 Type II cement. 2.01 C. Size 7 aggregate 2.01 E2. 15 % silica fume 2.01 F3 Size of steel fiber 2.02 B. Nozzel slump seeds to be identified.	The selection of the materials and the numerical values used in this specification (Wet Process Shotcrete) and the Dry Process Shotcrete Specification are normal and acceptable engineering decisions, and are correct. An analysis will be prepared to document these decisions, to support the engineering traceability. This analysis will explain the selection but will not change the content of these specifications. Therefore the analysis will be made subsequent to the specifications and will not have an impact to these Specifications.	Accept JWP 11/2/94
21. REVIEWED BY:		22. RESPONSE BY:		
John W. Peters <i>JWP</i> Print Name and Sign		Gerald W. Kaiser <i>Gerald W. Kaiser</i> Print Name and Sign		
11/1/94 Date		11/1/94 Date		

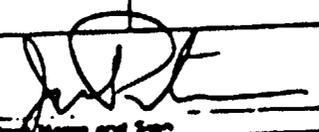
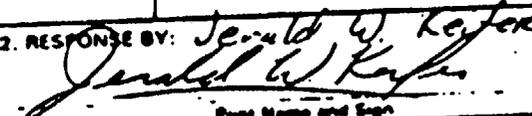
CRWM 100

29

Design Verification Record  
(Corrected)

13) QA  
PA - 10:42

15. DATE  
10/31/94

14. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (5th Release)				
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
21	BABEAB000-01717-6300-03363	<p>Section 2.02 B does not completely address ACI 506 2-4, Section 1.6.4.2, regarding panel construction. The dimensions recommended in the ACI Standard are 762 x 762 mm with the third dimension being equal to the dimension of the structure, but not less than 76 mm. Also it recommends providing the same reinforcement as in the structure or at least half of the panel to test for proper embedment of reinforcing steel. (WS)</p> <p>Retyped for legibility</p> <p>Section 2.02 B does not completely address ACI 506 2-4, Section 1.6.4.2, regarding panel construction. The dimensions recommended in the ACI Standard are 762 x 762 mm with the third dimension being equal to the dimension of the structure, but not less than 76 mm. Also it recommends providing the same reinforcement as in the structure in at least half of the panel to test for proper embedment of reinforcing steel. (WS)</p> <p>JWP, 11/2/94</p>	<p>ACI 506.2-4 1.6.3.2 specify that construction panel are 457mm X 457mm. For the preconstruction test panel they state that 762mm X 762mm are to be used and that reinforcement as in the structure is to be in at least one half of the panels. The shotcrete design does not contain reinforcement (deformed bar or Welded wire fabric) and the use of 460mm X 460mm has been judged adequate for the preconstruction testing based on the construction test panels size, lack of obstructive reinforcement and embedments and will provide the number of sample cores.</p> <p>This will be addressed in an analysis.</p> <p>JWP 11/4/94</p>	<p>Accepted</p> <p>JWP 11/4/94</p>
21. REVIEWED BY: John W. Peters		22. RESPONSE BY: Gerald W. Kayser		Date
 _____ Professional Name and Sign		 _____ Print Name and Sign		11/3/94 Date

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Design Verification Record  
(Continued)

WBS: 1.2.6  
QA: QA  
Page: 6 of 18  
13.

14. DESIGN PACKAGE TITLE		Quality Affecting Portion of Package 2C (5th release)	
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE
5	BABEAB000-01717-6300-03363.1.05.A	Reword to read "Shocrete: Portland Cement concrete (in accordance with ACI 506.2), pneumatically....."	<p><del>agree</del> will incorporate just 11/4/94</p> <p>Disagree - this addition would make the Shocrete to be in full compliance with ACI 506. The solution covering of Shocrete is not in compliance with ACI 506. Two in compliance to the other (shocrete) practice procedure is, however, in compliance.</p> <p>with design company in Shocrete analysis</p> <p>Deck 11/4/94</p>
21. REVIEWED BY:		22. RESPONSE BY:	
Matthew J. Gomez Print Name and Sign 			
Date: 10/31/94		Date: 11/1/94	

ACCEPTED

MMJ  
11/6/94  
11/6/94

30

Design Verification Record  
(Continued)

WBS: 1.2.6

13. QA: QA

Page: 14 of 18

14. DESIGN PACKAGE TITLE

Quality Affecting Portion of Package 2C (5th release)

15. DATE

10/31/94

16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
13	BABEAB000-01717-6300-03362. 1.05.A	Reword to read "Shotcrete: Portland Cement concrete (in accordance with ACI 506.2), pneumatically...."	Disagree - this addition would make the shotcrete to be in full compliance with ACI 506. The selected curing of shotcrete is not in conformance with ACI 506, but is in conformance to tunnel lining practice recommended by Technical organizations. <sup>Quality</sup> Will discuss the curing in subsequent analysis.	ACCEPT MJA 1/2/94 1/2/94

21. REVIEWED BY:

Matthew J. Gomez

*Matthew J. Gomez*  
Print Name and Sign

11/2/94  
Date

22. RESPONSE BY:

*Jerald W. Kayser*  
Print Name and Sign

11/2/94  
Date

36

Structural Steel Sets Analysis (DI #BABEAB000-01717-0200-00002 REV 04), Attachment IV, *2/2/0*  
Page IV-6:

**Adverse Condition:** Adequate documentation is not provided describing how the following equations for lateral ground loading on the steel sets were developed:

$e_1$  = soil active pressure (psf)/ft

$e_2$  = soil elastic reaction (psf)/ft

For  $k = 2$      $e_1 = -(0.4803 e_1 - 0.3625 q - 0.719 g)$

For  $k = 3$      $e_2 = -(0.905 e_1 - 0.739 q - 0.973 g)$

$e = e_1 + e_2$  = Total Soil Reaction Pressure

Representatives of the A/E design team were asked how these equations were developed. The design team representatives could not explain how the equations were developed nor could they show documentation as to how they were developed. Furthermore the M&O controls for checking and verification; e.g. discipline and interdiscipline reviews and design verification failed to denote this lack of documentation.

**Recommended Actions:**    Provide documentation showing the development of these equations.

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Design Verification Record  
(Continued)

14 DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (4th release)				15. DATE 10/14/94
16. COMMENT NO	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
4	SPEC. 03341 STEEL SETS AND ACCESSORIES SUBSURFACE SPECIFICATION  SECTION: 2.02 PAR.: B & C	There is no evidence of backup support- ing documentation (calculations or analysis) for the bending tolerances and the shop fabrication tolerances specified.	This will be included in the next revision of the analysis, <del>etc</del> (steel set analysis)  EMJ 10-27-94	ACCEPT WLT 10-27-94
21. REVIEWED BY William Hunt <u>William Hunt</u> Print Name and Sign		Date 10-25-94	22. RESPONSE BY E.M. JEDEN <u>EMJ</u> Print Name and Sign	
		Date 10/27/94		

Design Verification Record  
(Continued)

WBS: 1.2.6

13. QA: QA

Page: 5 Of: 5

15. DATE  
10/14/94

81  
10-27-94

14. DESIGN PACKAGE TITLE  
Quality Affecting Portion of Package 2C (4th release)

16. COMMENT NO	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
5	SPEC. 02341 STEEL SETS AND ACCESSORIES SUBSURFACE SPECIFICATION SECTION: J.03 PAR.: B.2.	There is no evidence of backup support- ing documentation (calculations or analysis) for the 100mm (4 inches) tolerance specified.	This will be included in the next revision of the analyses, (steel set analyses)	ACCEPT 10-27-94

21. REVIEWED BY:  
William Hunt *William Hunt* 10-25-94  
Print Name and Sign Date

22. RESPONSE BY:  
*[Signature]* 10/27/94  
Print Name and Sign Date

Design Verification Record  
(Continued)

14. DESIGN PACKAGE TITLE			15. DATE	
Quality Affecting Portion of Package 2C (4th release)			10/14/94	
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
7	IS NORTH RAMP STEEL SETS & LAGGING ELEVATION DRAWING, BY: BAREAB040-0777-2100-41101 REV. 03  NOTE 7.	Note 7. states, "Carriage bolts (grade A) shall conform to ASME B18.5-1990 and ASTM A307." This is no evidence of supporting documentation specifying this material conformance for the carriage bolts.	This will be incorporated into the next revision to the analyses, (steel set analyses)	ACCEPT 2/28/94 10-27-94
21. REVIEWED BY: William Hunt <i>William Hunt</i> 10-26-94 <small>Print Name and Sign Date</small>			22. RESPONSE BY: <i>[Signature]</i> 10/27/94 <small>Print Name and Sign Date</small>	

Design Verification Record  
(Continued)

DESIGN PACKAGE TITLE: Utility Affecting Portion of Package 2C (4th release) 15. DATE: 10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
6	BABEA000 -01717-6300 -02341 2.01.A.7	Is ASTM A500 the preferred material over ASTM A 53, Grade B.	Agree, ASTM A53 GRB will be specified. Steel set analysis and material deduction will be updated to reflect this change no impact on either analyses for stress considerations	ACCEPTED MD 10/27/94

21. REVIEWED BY: Matthew J Gomez *[Signature]* 10/25/94  
Print Name and Sign Date

22. RESPONSE BY: E.M. SEDENIK *[Signature]* 10/26/94  
Print Name and Sign Date

Design Verification Record  
(Continued)

DESIGN PACKAGE TITLE

15 DATE

ility Affecting Portion of Package 2C (4th release)

10/14/94

COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
0	BABEAB000 -01717-6300 -02341 3.03.A.1	Horizontal offset of 215mm exceeds the 210mm computed sum of maximum tolerances as shown in Structural Steel Sets Analysis Attachment V page V-3. Statement in analysis should also be revised to reflect 210mm.	Agree, next revision of the Steel Set Analysis will incorporate this adjustment	ACCEPT MA 10/27/94

21 REVIEWED BY: Matthew J Gomez *[Signature]* 10/25/94  
Date

22. RESPONSE BY: E.M. FEDERIK *[Signature]* 10/27/94  
Date

MS/M&O

# Design Verification Record (Continued)

WBS: 1.2.6

13 QA: QA

Page: 12 of 17

DESIGN PACKAGE TITLE

17 Affecting Portion of Package 2C (4th release)

15. DATE  
10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
	BABEAB000 -01717-6300 -02341  3.03.B.1	1219mm (4 ft) spacing should be a QA Control since it effects maximum loading on the steel sets.  This is a spacing, not a tolerance as stated.	Agree, a $\pm 2$ inch tolerance added. The next revision of the steel set analysis will incorporate the tolerance. At present there is sufficient reserve in the analysis to accommodate a 4% increase in stress levels	ACCEPT MD 10/27/94

1. REVIEWED BY:

Matthew J. Cannon

10/25/94

Print Name and Sign

Date

22. RESPONSE BY:

F.M. JEDEN

10/27/94

Print Name and Sign

Date

Design Verification Record  
(Continued)

DESIGN PACKAGE TITLE: *Item Affecting Portion of Package 2C (4th release)* 15. DATE: 10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
15	BABEAB000-01717-2100-41102 General	<p>Sections and Details do not match Structural Steel Set Analysis BABEAB000-01717-0200-(XXX)2 as follows:</p> <p>SECTION B Page III-41 shows a 3" slot.</p> <p>SECTION C Page III-34 shows a 15/16" diameter hole. Page III-34 shows a 1 1/2" dimension from c.l. of bolt to c.l. of beam.</p> <p>DETAIL 2 Page III-43 shows a 2" wedge flange width. Also since this is tapered, dimension should say VARIES (2" MAX).</p> <p>VIEW D Page III-6 shows an 8" long clip plate. No design found for 3/8" x 4" Sq plate.</p>	<p>The next revision of the steel set analysis and drawings will incorporate these comments.</p> <p>Section B - drawing correct, analysis to be corrected</p> <p>Section C - drawing correct, analysis to be corrected</p> <p>Detail 2 - analysis correct, drawing to be corrected</p> <p>View D - drawing correct, <sup>2017 10/27/94</sup> <del>analysis</del> analysis to be corrected.</p>	<p>ACCEPT  <i>MD</i>                  10/28/94</p>

21. REVIEWED BY: Matthew J Gomez *[Signature]* 10/26/94  
Print Name and Sign Date

22. RESPONSE BY: E.M. JEDEN *[Signature]* 10/27/94  
Print Name and Sign Date

# Design Verification Record (Continued)

WBS: 126

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QA: QA

Page: 17 of 17

VMS/M&O

15. DATE  
10/14/94

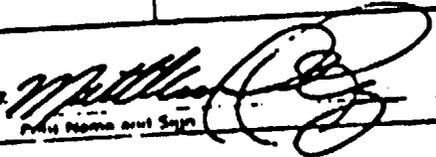
DESIGN PACKAGE TITLE

Activity Affecting Portion of Package 2C (4th release)

16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
16	BABEAB000-01717-2100-41103 General	<p>Sections and Details do not match Structural Steel Set Analysis BABEAB000-01717-0200-00002 as follows:</p> <p><b>DETAIL 1</b> Section III-6 of conclusions &amp; Page III-23 call for 3/4" x 8" x 1"-01/2" plate.</p> <p><b>VIEW A</b> Page III-17 calls for 3" to the first bolt. Page III-17 calls for 2 1/2" dimension from c.l. of bolt to c.l. of beam. Page III-16 &amp; III-17 show top line of holes in WB as alternate location of Jacking Bracket. Page III-22 shows edge of plate at 6 1/2" from c.l. of beam. Page III-37 shows 2 1/2" dimension from c.l. of bolt to c.l. of beam at slotted holes.</p> <p><b>DETAIL 2</b> Page III-16 shows a 1/2" end plate on of Jacking Bracket. Page III-17 shows 2" dimension for location of slotted holes.</p> <p><b>VIEW B</b> Page III-17 calls for 9/16 x 1 1/4" slotted hole. Page III-17 shows 3" dimension from c.l. of bolt to c.l. of beam at slotted holes. Page III-17 calls for 2 1/2" dimension from c.l. of bolt to c.l. of beam. Page III-16 shows a 1/2" plate along c.l. Page III-16 shows a 1/2" end plate on of Jacking Bracket.</p>	<p>AFTER REVIEW OF THE DRAWINGS AND ANALYSIS, THE DRAWINGS ARE CORRECT. THE SKETCHES IN THE ANALYSIS WERE A STARTING POINT FOR THE DRAWINGS. WITH THE NEXT REVISION OF THE ANALYSIS THE SKETCHES WILL BE UPDATED TO MATCH THE CORRECT INFORMATION ON THE DRAWING</p>	<p>ACCEPTED MM 10/28/94</p>

21. REVIEWED BY:

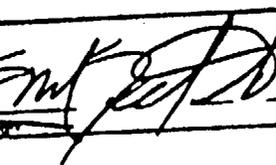
Matthew J. Gomez



10/26/94  
Date

22. RESPONSE BY:

E. M. ZEDENY



10/28/94  
Date

# Design Verification Record (Continued)

WBS: 1.2.6  
 QA: QA  
 Page: 14 of 33

CRWMS/M&O

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED DATE
13	BASE RB000-0177-0200-0003	<p>PARAGRAPH 0177-0200-0003 2.1 MATERIAL DEDICATION ANALYSIS FOR COMMERCIAL GRADE STEEL-STEEL SETS</p> <p>This analysis states that "the items analyzed in this document are steel sets and accessories used in the 75 north ramp ground support". This analysis hinges on the premise that items procured as "commercial grade" are to be dedicated and provided for inspection and test methodology for doing this. By definition an "engineered item" cannot be "commercial grade". However a review of the MO steel set procurement drawings disclose that the steel sets are "engineered items". Per the QAD definition Commercial Grade items are those "not subject to design or specification criteria unique to the program or nuclear facilities, and ordered from the manufacturer or supplier on the basis of specifications set forth in the manufacturer's published product description." As such while steel set components may in fact be procured as commercial grade and dedicated at the site, fabricated steel sets to the MO drawings must be procured from a qualified supplier in accordance with QAD requirements and have nothing to do with commercial grade dedication. This analysis falls to make this distinction and infer that the steel sets are procured as commercial grade... They are not.</p>	<p>THE MATERIALS DEDICATION ANALYSIS BASE RB000-0177-0200-0003 REV03, WILL BE REVISED TO REFLECT:</p> <ol style="list-style-type: none"> <li>1. STEEL SETS ARE AN ENGINEERED ITEM, BUT THAT COMPONENTS THAT OF STEEL SETS MAY BE PURCHASED AS COMMERCIAL GRADE ITEMS WHICH MEET QAD DEFINITION</li> <li>2. PURPOSE OF THE ANALYSIS IS TO ESTABLISH CRITICAL AND FUNCTIONAL CHARACTERISTICS OF THE STEEL.</li> <li>3. INSPECTION AND TESTS IDENTIFIED IN THE ANALYSIS MAY BE USED TO ENSURE THE CRITICAL AND FUNCTIONAL CHARACTERISTICS.</li> </ol>	10/14/94
14. DESIGN PACKAGE TITLE		15. DATE		
Quality Affecting Portion of Package 2C (4th release)		10/14/94		
21. REVIEWED BY: John W Peters		22. RESPONSE BY: JEAN H PETERSON <i>JHP</i>		10/27/94

3VMSM/RKO

### Design Verification Record (Continued)

WBS: 1 2 6

(13)

QA: QA

Page: 15 of 33

#### 4 DESIGN PACKAGE TITLE

Utility Affecting Portion of Package 2C (4th release)

15 DATE

10/14/94

6 COMMENT NO. 17. DOCUMENT SECTION/PARAGRAPH

BASE ABANDON-01717-0200-00001

#### COMMENTS

REQUIREMENTS-01117-0200-0001 R-3 MATERIAL SPECIFICATION ANALYSIS FOR COMMERCIAL GRADE STEEL-STEEL SETS DEFINITION FOR COMMERCIAL GRADE STEEL - SHOULD BE INCLUDED.

#### RESPONSE

AGREE. WILL INCLUDE THE CORRECT DEFINITION OF COMMERCIAL GRADE ITEM IN THE NEXT REVISION OF THE ANALYSIS.

20 ACCEPTED

*[Signature]*  
10/27/94

#### 21. REVIEWED BY:

John W Peters

*[Signature]*  
Print Name and Sign

10/26/94

#### 22. RESPONSE BY:

JOHN H. PYTE

*[Signature]*  
Print Name and Sign

11/27/94

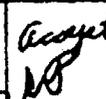
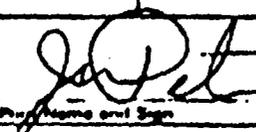
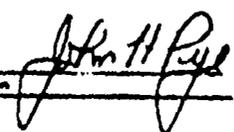
RWMS/M30

## Design Verification Record (Continued)

WBS: 126

13. QA: QA

Page: 16 of 33

4. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (4th release)			15. DATE 10/14/94	
6. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
5	BASE AB000-0177-0200-00003	<p>BABE0000-0177-0200-0000) R-) MATERIAL DEDICATION ANALYSIS for COMMERCIAL GRADE ITEMS-STEEL SETS            Per 6.1. As identified in the Material Dedication Analysis for Acrobates, Testing Criteria must meet QARD Section 11 criteria. This analysis specifically addresses meeting QARD Section 10 requirements for satisfying "Inspection and Test Plan" requirements. QARD Section 11 also applies. The analysis and specification specifically identify "testing" requirements. See previous comments.</p>	<p>ACCEPT. CHANGES WERE MADE TO THE MATERIALS DEDICATION ANALYSIS BABEAB000-0177-0200-00003 REV 01. IN REGARDS TO REMOVING QARD SECTION 10 &amp; 11, WERE MADE TO THE BABEAB000-0177-0200-00003 REV 03 THE ONLY REFERENCE TO QARD SECTION 10 IS A QUOTE FROM THE YMP DESIGN PLAN, WHICH IS THE BASIS FOR INCLUDING INSPECTION AND TEST CRITERIA IN THE SPECIFICATION AND NOT PRODUCING A SEPARATE PLAN</p>	<p>Accept              10/27/94</p>
21. REVIEWED BY: John W. Peters  10/26/94		22. RESPONSE BY: JOHN H. PLYE  10/27/94		

NMS/M&O

### Design Verification Record (Continued)

WBS: 126  
 (13) QA: QA  
 Page: 17 of 33

DESIGN PACKAGE TITLE Utility Affecting Portion of Package 2C (4th release)	15. DATE 10/14/94
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COMMENT NO.	DOCUMENT SECTION/PARAGRAPH	COMMENTS	RESPONSE	ACCEPTED
	17. BABENB000 - 01717-0200 - 00002	18. Structural Steel Set Analysis of 0 BABENB000-01717-0200-00002 Rev 04 Attachment 1, Page I-3: Equations for determining the horizontal and vertical components of the jacking force are incorrect. $F_x = P \sin \theta$ should be $F_x = P \cos \theta$ and $F_y = P \cos \theta$ should be $F_y = P \sin \theta$ . This impacts the jacking load analysis and possibly some of the subsequent structural analyses. (MS)	19. ACCEPT. THE SINE AND COSINE VALUES ASSOCIATED WITH THE DETERMINATION OF $F_x$ AND $F_y$ WERE INCORRECTLY IDENTIFIED. THE RESULTS OF RE-ANALYSIS INDICATE LESS THAN A 2% CHANGE IN THE INTERACTION RATIOS WHICH IS NOT CONSIDERED SIGNIFICANT AND DOES NOT CHANGE THE STEEL SET DESIGN. THIS WILL BE ADDRESSED BY INCORPORATING THE RE-ANALYSIS WHEN THE STEEL SET ANALYSIS IS REVISED.	20. ACCEPT <i>John H. Pye</i> 10/27/94

21. REVIEWED BY: *John W. Peters* 10/26/94  
Print Name and Sign Date

22. RESPONSE BY: JOHN H. PYE 10/27/94  
Print Name and Sign Date

DESIGN PACKAGE TITLE		15. DATE	ACCEPTED
Utility Affecting Portion of Package 2C (4th release)		10/14/94	20
17. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE
18	8A8E18 000 - 01717 - 0208 - 00002	Structural Steel Etc Analysis of 8A8E18000-01717-0208-00002 Rev 00 Attachment 11, page 1-2, Assumptions 1 and 2 at the bottom of the page need to be identified in Section 7 "Assumptions" of the Cont. (102)	Assumption 1 is an input not an assumption. <del>Assumption 2</del> Assumption 2 is an assumption and will be listed in Section 7 Assumption when the analysis is next reviewed. 10/27/94
21 REVIEWED BY:		22. RESPONSE BY:	
John W. PETERS		E.M. Pedersen	
10/26/94		10/27/94	
Date		Date	

WMS/M&O

# Design Verification Record (Continued)

WBS: 126  
 (13) QA: QA  
 Page: 24 of 38

DESIGN PACKAGE TITLE: Quality Affecting Portion of Package 2C (4th release)      15. DATE: 10/14/94

COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
73	BABE18000-01717-0200-00002	Structural Steel Base Analysis DI 0 BABE18000-01717-0200-00002 Rev 04 Attachment IV, Page IV-5. The assumption that the steel net loading $M_u$ will be equal to 0.75B needs to be identified in Section 7 "Assumptions" of the cont. (M&O)	ACCEPT. WILL CITE AS AN ASSUMPTION IN SECTION 7 OF THE ANALYSIS WHEN REVISED.	Accepted <i>J. Pye</i>

21. REVIEWED BY: *John W. Piers*      10/26/94  
Print Name and Sign      Date

22. RESPONSE BY: JOHN H. PYE 10/27/94  
Print Name and Sign      Date

6	4. DESIGN PACKAGE TITLE	17. DOCUMENT SECTION/ PARAGRAPH	16. COMMENTS	19. RESPONSE	20. ACCEPTED
28	0117-0200-0008	0117-0200-0008	<p>Requirements Allocation Analysis for Furnishings of BABAC000-0171-0200-0001 Revision 1 and the Requirements Allocation Analysis for Linings and Ground Support of BABAC000-0171-0200-0008 Revision 1 under method state: "by detailed review of the ESRDA". Contrary to the stated method it has been determined that inconsistencies exist between RAA. It is not clear what the rationale is for determining which ESRDA are applicable to each individual RAA. For example ESRDA requirement 3.2.1.3.3 is identified as applicable to Requirements Allocation Analysis for Furnishings of BABAC000-0171-0200-0001 Revision 1 but is not identified in the Ground Support RAA. Additionally, engineers preparing RAA have different approaches to identifying upper tier requirements. In one case, the Ground Support RAA preparer identifies each ESRDA requirement as stated. In another case the preparer for the Furnishing RAA specifies only one requirement if that requirement contained elsewhere (See ESRDA Requirements 3.2.1.3.3, 3.2.1.3.4, 3.2.1.3.5 for this type of inconsistency. (RLM)</p>	<p>MTC <del>XXXXXXXXXX</del> MANAGEMENT <del>XXXXXXXXXX</del> TAKEN THIS COMMENT UNDER ADVISEMENT AND WILL TAKE APPROPRIATE STEPS TO ESTABLISH CONSISTENCY IN THE PREPARATION OF THE RAA. A NATURAL WORKING GROUP HAS BEEN FORMED WITHIN THE MCO TO ADDRESS THIS AND <del>REF</del> RELATED CONCERNS.</p>	<p>Accepted 10/14/94</p>

21. REVIEWED BY: John W. Peters 10/27/94 Date

22. RESPONSE BY: John N. Pye 10/27/94 Date

Print Name and Sign

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C3 (part c) - Drawings & Specification Draft/Revision: N/A  Q  
 Document Number: N/A Governing Document: N/A Date: N/A  Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
1. *	45608 41152	These dwgs have a mix of metric and english dimensions that should be all metric. Dwg 45609 is a dwg of similar components, which is done all in metric. Suggest that at the next revision A/E change all relevant dimensions to Metric.	Agree  10-13-94	Accept BVL 10/13/94

5. Comments B. J. Vecna Date: 10/13/94

Design Verification Record  
(Continued)

WBS: 1.2.6  
QA: QA  
Page: 5 of 14  
15. DATE: 09/29/94

13

14. DESIGN PACKAGE TITLE  
Quality Affecting Portion of Package 2C (3rd release)

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
<p>JJC 4 QA 10-11-94</p>	<p>BABEAB000-01717-2100-40151 196 10-10-94</p>	<p>TS North Ramp Ground Support Master Elevation and Section DI BABEAB000-01717-2100-40151 Revision : Draft. The Table on this drawing calls out installation of Structural Steel Sets for Category 5 ground support. However, the TS North Ramp Scoping Analysis DI BABEAB000-01717-0200-0010 Rev : page 51 of 81 specifically calls out installation of W8 x 31 steel sets. It is not clear where the source of the specific requirement for installation of W8x 31 steel sets comes from for the analysis and why this requirement is not captured in Drwg 40151. (QAP 6.2 Review Criteria 3.7 and 3.10) WJA</p> <p>NOTE: THIS COMMENT GENERATED BY OQA DURING SURVEILLANCE. I CONCUR JJC 10-11-94</p>	<p>The TS North Ramp Scoping Analysis will be revised to delete the callout for the size of the steel sets, adding wording to the effect that the size will be determined via separate analysis. Since this change will not impact any of the associated design outputs, the revision will be made after the design package is issued and the appropriate inputs sheets will be updated accordingly.</p>	<p>JJC 10-11-94 AQU407</p>

21. REVIEWED BY:

John J. Clark

*[Signature]*

Print Name and Sign

10-10-94

Date

22. RESPONSE BY:

John H. Pyle

*[Signature]*

Print Name and Sign

JOHN H. PYLE

10-11-94

Date

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
<p>10-11-94 J.C. 08 10-11-94</p>	<p>TS NORTH RAMP GROUND SUPPORT SCOPING... B06E8000-01717-0200-00010 SECT. 5.0</p>	<p>REGARDING DESIGN INPUTS</p> <p>p.11 of the scoping analysis calls out the following design inputs:</p> <p>TDIF #302273 provided by SNL (Design Input 5.2) TS North Ramp Mass Classification (Design Input 5.3) TS North Ramp Stability Analysis (Design Input 5.4) TS North Ramp Alcove Ground Support Analysis (Design Input 5.5)</p> <p>These design inputs are not listed in the Section 5.0 of the Analysis. Demonstrate that these inputs were appropriately identified and checked in accordance with CAP-3-9. (RLH)</p> <p>NOTE: THIS COMMENT GENERATED BY OQA DURING SURVEILLANCE. I CONCUR 10-11-94</p>	<p>Page 11 of the scoping analysis will be changed (as a part of the revision to this document as discussed under 5. above) to delete the bulletized wording. The item under the first bullet is presently captured in Design Inputs, Section 5. The remainder of the items were not design input. They are used as references elsewhere in the scoping analysis that confirm the appropriateness of the designs selected in the scoping analysis. The analysis will be clarified to better address the relationship of these analyses to one another when it is revised.</p> <p>THIS CHANGE WILL NOT IMPACT ANY OF THE ASSOCIATED DESIGN OUTPUTS, THE REVISION WILL BE MADE AFTER THE DESIGN PACKAGE IS ISSUED AND THE APPROPRIATE INPUTS SHEETS WILL BE UPDATED ACCORDINGLY. JNP 10/10/94.</p>	<p>10-11-94 ACCEPTED 10-11-94</p>

21. REVIEWED BY: John J. Clark  
 22. RESPONSE BY: John J. Clark  
 Date: 10-10-94  
 Date: 10-11-94

Design Verification Record  
(Continued)

14. DESIGN PACKAGE TITLE  
Quality Affecting Portion of Package 2C (3rd release)  
15. DATE  
09/29/94

16. COMMENT NO.  
17. DOCUMENT SECTION/ PARAGRAPH  
18. COMMENTS  
19. RESPONSE  
20. ACCEPTED

<p>YJC 04/7 10-11-94</p>	<p>BABEAB000-01717-6300-02165 SECT. 6.1 &amp; 6.2 &amp; 6.3</p>	<p>The Specification Inputs list for BABEAB000-01717-6300-02165 Rev 4 "Rockbolts ad Accessories" identifies the Material Dedication Analysis (DI BABEAB000-01717-0200-00009 rev 1) as a design input. This analysis clearly describes both Inspection and Test requirements as addressed in QARD section 7.2.12 for commercial grade items. (The QARD allows for either.) Testing (section 11.0 and Inspection (QARD section 10.0) are different elements of the YMP QA program. Section 6.0 of the analysis refers to QARD Section 7.2.12 D and QARD Section 10 but not to QARD Section 11.0. The analysis specifically calls for Inspection or Testing of commercial grade items in para 10.1.4; inspection and testing in 10.3.1.1 and 10.3.1.3 for rockbolts; testing of shotcrete cores in paragraph 10.3.2.2; rockbolt Test Requirements in 10.4.3.1 and separate inspection requirements in paragraph 10.4.3.3; construction testing requirements in 10.5.3.1 and construction inspection requirements in para 10.5.3.3. QARD Section 11.0 (Testing) requirements are not imposed as required by the QARD. (CAP 6.2 Review Criteria 3.9) KOG</p> <p>NOTE: THIS COMMENT GENERATED BY O QA DURING SURVEILLANCE. I CONCUR</p> <p>10-11-94</p>	<p>The Materials Dedication Analysis will be revised to delete the following: 1) the last sentence in Section 6.1 will be deleted, 2) all of Section 6.2 will be deleted, and, 3) all of Section 6.3 will be deleted. Since this change will not impact any of the associated design outputs, the revision will be made after the design package is issued and the appropriate inputs sheets will be updated accordingly.</p>	<p>10-11-94 RECTOR</p>
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21. REVIEWED BY:

John J. Clark

*[Signature]*

10-10-94

22. RESPONSE BY:

*[Signature]*

DANA V. ROGERS

10-11-94

Design Verification Record  
(Continued)

14. DESIGN PACKAGE TITLE			15. DATE	
Quality Affecting Portion of Package 2C (5th Release)			10/31/94	
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
1	BABEAB000-01717-6300-62344 General 03665	An analysis should be prepared to document the values and engineering decisions used in this specification which are not documented in the already cited analyses. Examples are: 2.01 B. ASTM C150 Type II cement. 2.01 C. Size 7 aggregate 2.01 E2. 15 % silica fume 2.01 F3 Size of steel fiber 2.02 B. Nozzel slump needs to be identified.	The selection of the materials and the numerical values used in this specification (Wet Process Shotcrete) and the Dry Process Shotcrete Specification are normal and acceptable engineering decisions, and are correct. An analysis will be prepared to document these decisions, to support the engineering traceability. This analysis will explain the selection but will not change the content of these specifications. Therefore the analysis will be made subsequent to the specifications and will not have an impact to these Specifications.	Accept JWP 11/2/94
21. REVIEWED BY:		22. RESPONSE BY:		
John W. Peters <i>JWP</i> Print Name and Sign		Jerald W. Kiefer <i>Jerald W. Kiefer</i> Print Name and Sign		
11/1/94 Date		11/1/94 Date		

15. DATE  
10/31/94

14. DESIGN PACKAGE TITLE  
Quality Affecting Portion of Package 2C (5th Release)

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
21	BABEAB000-01717-6300-03363	<p>Section 2.02 B does not completely address ACI 506 2-4, Section 1.6.4.2, regarding panel construction. The dimensions recommended in the ACI Standard are 762 x 762 mm with the third dimension being equal to the dimension of the structure, but not less than 76 mm. Also it recommends providing the same reinforcement as in the structure in at least half of the panel to test for proper embedment of reinforcing steel. (WS)</p> <p>Retyped for legibility</p> <p>Section 2.02 B does not completely address ACI 506 2-4, Section 1.6.4.2, regarding panel construction. The dimensions recommended in the ACI Standard are 762 x 762 mm with the third dimension being equal to the dimension of the structure, but not less than 76 mm. Also it recommends providing the same reinforcement as in the structure in at least half of the panel to test for proper embedment of reinforcing steel. (WS)</p> <p><i>JWP, 11/2/94</i></p>	<p>ACI 506.2-4 1.6.3.2 specify that construction panel are 457mm X 457mm. For the preconstruction test panel they state that 762mm X 762mm are to be used and that reinforcement as in the structure is to be in at least one half of the panels. The shotcrete design does not contain reinforcement (deformed bar or Welded wire fabric) and the use of 460mm X 460mm has been judged adequate for the preconstruction testing based on the construction test panels size, lack of obstructive reinforcement and embedments and will provide the number of sample cores.</p> <p><i>This will be address in an analysis.</i></p> <p><i>JWP 11/4/94</i></p>	<p><i>Accept</i></p> <p><i>JWP</i></p> <p><i>11/4/94</i></p>

21. REVIEWED BY: *[Signature]*  
John W. Peters  
Date: 11/3/94

22. RESPONSE BY: *[Signature]*  
Gerald W. Keyser  
Date: 11/4/94

Design Verification Record  
(Continued)

14. DESIGN PACKAGE TITLE  
Quality Affecting Portion of Package 2C (5th release)

15. DATE  
10/31/94

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
5	BABEAB000-01717-6300-03363. 1.05.A	Reword to read "Shotcrete: Portland Cement concrete (in accordance with ACI 506.2), pneumatically...."	<p><del>agree will incorporate</del> <i>Jul 11/4/94</i></p> <p>Disagree - this addition would make the shotcrete to be in full compliance with ACI 506. The selected curing of shotcrete is not in conformance with ACI 506, but is in conformance to tunnel lining practice recommended by tunneling organizations.</p> <p>Will design curing in subsequent analysis</p> <p><i>Jul 11/4/94</i></p>	<p>ACCEPTED</p> <p><i>MS</i></p> <p><i>11/4/94</i></p> <p><i>MS</i></p> <p><i>11/4/94</i></p>

21. REVIEWED BY:  
Matthew J. Gomez *[Signature]* 10/31/94  
Print Name and Sign Date

22. RESPONSE BY:  
*[Signature]* 11/4/94  
Print Name and Sign Date

# Design Verification Record (Continued)

14. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (5th release)			15. DATE 10/31/94	
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
13	BABEAB000-01717-6300-03362. 1.05.A	Reword to read "Shotcrete: Portland Cement concrete (in accordance with ACI 506.2), pneumatically...."	Disagree - this addition would make the shotcrete to be in full compliance with ACI 506. The selected curing of shotcrete is not in conformance with ACI 506, but is in conformance to tunnel lining practice recommended by technical organizations. <sup>Final 11/4/94</sup> Will discuss the curing in subsequent analysis.	ACCEPT MJD <del>1/4/94</del> MJD 1/4/94

21. REVIEWED BY: Matthew J. Gomez *Matthew Gomez* 11/2/94  
Print Name and Sign Date

22. RESPONSE BY: Jerald W. Kester *Jerald W. Kester* 11/4/94  
Print Name and Sign Date

YMP-110-R3  
06/20/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C2 (part b) - Drawing Inputs List Draft/Revision: N/A  Q  
Document Number: See page 2 of DAR Governing Document: \_\_\_\_\_ Date: \_\_\_\_\_  Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
#17	DIE FOR PACKAGE 2c	ESFDR requirement 3.2.1.1A is identified in the Determination of Importance Evaluation for Package 2C as a source for DIE requirements 6,7,8, and 11. This is a requirement for surface facilities and should not flow down to Package 2C. Please delete references to ESFDR requirement 3.2.1.1A from the DIE. (6.2 Review Criteria 3.7, 3.9. & 3.11)	Agree. Will update ESFDR references in Revision 03 of the 2C DIE. (BAB000000-0177-2200-00005) <i>Paul W. [Signature]</i> 10/3/94	Accept <i>[Signature]</i> 10/2/94  3/10/94

5. Comments John F Pelletier Date: 10/2/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

1. Document Title: Package 2C2 (part b) - Drawing Inputs List Draft/Revision: N/A  **Q**  
 Document Number: See page 2 of DAR Governing Document: \_\_\_\_\_ Date: \_\_\_\_\_  **Non Q**

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
*16	DIE FOR PACKAGE 2C	ESFDR requirement 3.2.2.1.J1 is identified in the Determination of Importance Evaluation for Package 2C as a source for DIE requirement 11. This is a requirement for surface facilities and should not flow down to Package 2C. Please delete references to ESFDR requirement 3.2.2.1.J1 from the DIE. (6.2 Review Criteria 3.7, 3.9. & 3.11)	Agree. Will update ESFDR references in Revision 03 of the 2C DIE. (88800000-01717-2200-00005) <i>Stalw W. H. H.</i> 10/3/94	Accept <i>RPJ</i> 10/4/94

5. Comments John F Pelletier Date: 10/2/94



CRWMS/M&O

# 90% Design Review - Design Package 2C

## Document Review Record (Continued)

WBS: 1.  
OA:  
Page: 2 of 1

DOCUMENT TITLE		REVISION	DATE	DOCUMENT IDENTIFIER
Design Package 2C Review		N/A	N/A	N/A
COMMENT NO.	SECTION/ PARAGRAPH	COMMENTS	RESPONSE	ACCEP REJEC
1	General: Specs	<input checked="" type="checkbox"/> Mandatory - Requirement # <u>N/A</u> <input type="checkbox"/> Non-Mandatory (No Response Required)  General - Specifications do not seem to follow the same format, in all cases. They do not follow the format in QAP-3-8, however, the specifications do seem to follow the general format described in the MGDS Design Process Guidelines Manual. However, many of the specifications are missing a section titled, "Field Quality Control." Recommend that you (1) adopt a format and stick to it; and (2) that you review QAP-3-8 and revise the format if you do not intend on using it.	Agree: ESF Project Specifications Sections will use CSI Specs. format which is spelled out in QAP-3-8, Rev. 4.  Field Quality Control is in Section 01400 of Division I. A new Section 01000 will define Divisions I-16.  RP 7/5/94	Accr 6/18/94 6/18/94 SE APPROV 6/18/94 6/18/94
REVIEWED BY:		RESPONSE BY:		
S. DANA <i>S. Dana</i>		Robert A. Skorseth <i>Robert A. Skorseth</i>		
Printed Name & Signature		Printed Name & Signature		
5/23/94		5/25/94		
Date		Date		

2C  
264

# 90% Design Review - Design Package 2C

## Document Review Record (Continued)

WBS: 1.2.6  
QA: QA  
Page: 3 of 40

CRWMS/M&O

DOCUMENT TITLE		REVISION	DATE	DOCUMENT IDENTIFIER	ACCEPT/ REJECT
Various Specs		N/A	N/A	Various	
COMMENT NO.	SECTION/ PARAGRAPH	COMMENTS		RESPONSE	ACCEPT/ REJECT
2C 093	N/A	<input checked="" type="checkbox"/> Mandatory - Requirement # N/A <input type="checkbox"/> Non-Mandatory (No Response Required) Certain Specs mix QA and QC. Putting a requirement in a QA section that does not require QA involvement presents an opportunity for un-necessary QA involvement and a waste of Project funds. Examples are: Sect 14553 - Paragraph 1.04 B " 15061 - " 1.04 C " 15160 - " 1.04 C " 15191 - " 1.04 C " 15261 - " 1.04 C " 15300 - " 1.04 B, C, D " 15371 - " 1.04 C, D " 15452 - " 1.04 C " 05121 - " 1.04 C, D, E, F " 13430 - " 1.04 C, D " 13430 - " 1.04 C, D All of these paragraphs should be removed from the QA section 1.04		QA requirements will be clearly identified as such and separated from non QA requirements.	ACCEPT JAB 6/1/94
REVIEWED BY: B. Varna Jaime A. Gonzalez		Date: 5/20/94		RESPONSE BY: ROBERT S STUNDERS Date: 5-27-94	

**OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.**

8 CAR NO. YM-94-065	
PAGE	OF
	QA

**CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)**

**Amended Remedial Action**

The amended response dated December 20, 1994, stated MGDS Development would revise the following to include the design verification comments shown on the attachments:

BABEAB000-01717-0200-00002, Structural Steel Sets Analysis (attached comments 12, 13, 14, 15, 19, 20, 21, and 36)  
BABEAB000-01717-0200-00003, Material Dedication Analysis for Commercial Grade Items - Steel Sets (attached comment 16)  
BABEAB000-01717-0200-00013, Shotcrete Ground Support Scoping Analysis (attached comments 27, 28, 29, and 30)  
Drawings 41152 and 45608 (attached comment 23)

Since the time of that response there has been a change requested by the YMP AMEFO. The AMEFO has requested we combine our underground design packages for the North Ramp (2C), the Main Drift (8A), and the South Ramp (4) into one design package. The analyses and drawings have not been through the checking process because of the schedule delay caused by this change in scope. MGDS Development will also combine several analyses into one larger analysis. The Shotcrete Ground Support Scoping Analysis will become part of this larger analysis. Therefore, MGDS Development amends our response as follows:

MGDS Development has only draft copies of the analyses and drawings. At the present time these documents are not expected to be complete until June. These draft copies will be available to OQA to examine to ensure the comments have been incorporated. MGDS Development requests OQA use these draft documents as the basis for closure of this portion of the CAR. These changes will remain in the final versions of the documents unless circumstances require removal. If it does become necessary to remove or modify one of these changes MGDS Development will document, justify, and obtain OQA approval prior to removal or modification.

**Amended Action to Preclude Recurrence**

**Revise to read:**

A management decision was made to form the MGDS Development Product Checking Group (PCG). The PCG will strengthen the implementation of the M&O engineering activities in the areas of process performance monitoring and checking. The PCG performs the checking function for all design products including, but not limited to, analysis, input lists, drawings, specifications, and reports. The PCG assures all MGDS Development design products are thoroughly checked in a rigorous manner independent of product development schedules, and provides assurance to M&O and DOE management that design products meet expectations for QA compliance and technical quality.

The PCG is developing compliance and technical checklists for use in ensuring the products are developed and checked to the standards of excellence required. These checklists will be used by both the PCG and the designers.

The PCG has already had the opportunity to put several documents through the checking process. These documents will be available to OQA. This will provide objective evidence of the effectiveness of the checking group.

17

WMS/MCO

Design Verification Record  
(Continued)

13

WBS: 126

QA: QA

Page: 11 of 17

15 DATE  
10/14/94

DESIGN PACKAGE TITLE  
Utility Affecting Portion of Package 2C (4th release)

17. COMMENT NO.	18. DOCUMENT SECTION PARAGRAPH	19. COMMENTS	20. RESPONSE
10	BASEAB000 -01717-6300 -07341 3.03.A.1	Horizontal offset of 215mm exceeds the 210mm computed sum of maximum tolerances as shown in Structural Steel Sets Analysis Attachment V page V-3. Statement in analysis should also be revised to reflect 210mm.	Agree, note revision of the Steel Set analysis will incorporate this adjustment

ACCEPTED

Accept  
M.A.  
10/27/94

21. REVIEWED BY:

10/27/94  
10/27/94

22. RESPONSE BY:

E.M. S...  
10/27/94

13

VMS/M&O

### Design Verification Record (Continued)

WBS: 1.26

13 QA: QA

Page: 12 of 17

DESIGN PACKAGE TITLE

15. DATE

Any Affecting Portion of Package 2C (4th release)

10/14/94

11. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
11	BASEAB000 -01717-6300 -02341  3.03.B.1	1219mm (4 ft) spacing should be a QA Control since it effects maximum loading on the steel sets.  This is a spacing, not a tolerance as stated.	Agree, a $\pm 2$ inch tolerance added. The next revision of the steel set analysis will incorporate the tolerance. At present there is sufficient reserve in the analysis to accommodate a 4% increase in stress levels	ACCEPT MD 10/27/94

21. REVIEWED BY:

Matthew J. Gomez

10/25/94

Print Name and Sign

22. RESPONSE BY:

F. M. JODEN, L. E. M. [Signature]

10/27/94

Print Name and Sign

14

TMNS/M&O

### Design Verification Record (Continued)

WBS: 126

QA: QA

Page: 16 of 17

15. DATE  
10/14/94

1. DESIGN PACKAGE TITLE  
Valley Affected Portion of Package 2C (4th release)

17. DOCUMENT SECTION PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
<p>15</p> <p>BABEAB000-01717-2100-41102 General</p>	<p>Sections and Details do not match Structural Steel Set Analysis BABEAB000-01717-0301-001102 as follows:</p> <p>SECTION B Page III-41 shows a 3" slot.</p> <p>SECTION C Page III-34 shows a 1 5/16" diameter hole.</p> <p>Page III-34 shows a 1 1/2" dimension from c.l. of bolt to c.l. of beam.</p> <p>DETAIL 2 Page III-43 shows a 2" wedge flange width. Also since this is tapered, dimension should say VARIES (2" MAX).</p> <p>VIEW D Page III-6 shows an 8" long clip plate. No design found for 3/8" x 4" Sq plate.</p>	<p>The next revision of the steel set analysis and drawings will incorporate these comments.</p> <p>Section B - drawing correct, analysis to be correct, analysis to be correct, drawing to be corrected.</p> <p>Detail 2 - analysis correct, drawing to be corrected.</p> <p>View D - drawing correct, analysis to be corrected.</p>	<p>ACCEPTED</p> <p>10/27/94</p>

21. REVIEWED BY: Matthew J. Gomez *[Signature]* 10/26/94

22. RESPONSE BY: E.M. J. *[Signature]* 10/27/94

15

WMS/M&O

### Design Verification Record (Continued)

WBS: 126  
QA: QA  
Page: 17 of 17

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DESIGN PACKAGE TITLE: Analysis Affecting Portion of Package 2C (4th release) 15 DATE: 10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
16	BABEAB000-01717-2100-41103 General	<p>Sections and Details do not match Structural Steel Set Analysis BABEAB000-01717-0200-00002 as follows:</p> <p><b>DETAIL 1</b> Section 11.6 of conclusions &amp; Page III-23 call for 3/4" x 8" x 1'-0 1/2" plate.</p> <p><b>VIEW A</b> Page III-17 calls for 3" to the first bolt. Page III-17 calls for 2 1/2" dimension from c.l. of bolt to c.l. of beam. Page III-16 &amp; III-17 show top line of holes in WB as alternate location of Jacking Bracket. Page III-22 shows edge of plate at 6 1/2" from c.l. of beam. Page III-37 shows 2 1/2" dimension from c.l. of bolt to c.l. of beam at slotted holes.</p> <p><b>DETAIL 2</b> Page III-16 shows a 1/2" end plate on of Jacking Bracket. Page III-17 shows 2" dimension for location of slotted holes.</p> <p><b>VIEW B</b> Page III-17 calls for 9/16 x 1 1/4" slotted hole. Page III-17 shows 3" dimension from c.l. of bolt to c.l. of beam at slotted holes. Page III-17 calls for 2 1/2" dimension from c.l. of bolt to c.l. of beam. Page III-16 shows a 1/2" plate along c.l. Page III-16 shows a 1/2" end plate on of Jacking Bracket.</p>	<p>AFTER REVIEW OF THE DRAWINGS AND ANALYSIS, THE DRAWINGS ARE CORRECT. THE SKETCHES IN THE ANALYSIS WERE A STARTING POINT FOR THE DRAWING. WITH THE NEXT REVISION OF THE ANALYSIS THE SKETCHES WILL BE UPDATED TO MATCH THE CORRECT INFORMATION ON THE DRAWING</p>	<p>ACCEPTED MJD 10/20/94</p>

21. REVIEWED BY: Matthew J Gomez *[Signature]* 10/20/94

22. RESPONSE BY: E.M. JEDEN *[Signature]* 10/20/94

19

WBS: 126  
QA: QA  
Page: 17 of 37

### Design Verification Record (Continued)

JMS/M&O

17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
16 BASES 800 - 0717-0200 - 00002	Structural steel base analysis of 9 members-0717-0200-0002 per Attachment 2, Page 2-5. Equations for determining the horizontal and vertical components of the jacking force are incorrect. $F_x$ , $F_y$ , $F_z$ should be $F_x$ , $F_y$ , $F_z$ and $F_x$ , $F_y$ , $F_z$ should be $F_x$ , $F_y$ , $F_z$ in a. This impacts the jacking load analysis and possibly some of the subsequent structural analysis. (u)	ACCEPT. THE S&G AND CORNE VALUES ASSOCIATED WITH THE DETERMINATION OF $F_x$ AND $F_y$ WERE INCORRECTLY IDENTIFIED THE RESULTS OF RE-ANALYSIS INDICATE LESS THAN A 2% CHANGE IN THE INTERACTION RATIOS WHICH IS NOT CONSIDERED SIGNIFICANT AND DOES NOT CHANGE THE STEEL SET DESIGN. THIS WILL BE ADDRESSED BY INCORPORATING THE RE-ANALYSIS WHEN THE STEEL SET ANALYSIS IS REVISED.	accept gms 10/27/94

DESIGN PACKAGE TITLE: 19  
 15. DATE: 10/14/94  
 21. REVIEWED BY: [Signature] 10/26/94  
 22. RESPONSE BY: JOHN H. PYE 10/27/94  
 Job No: \_\_\_\_\_ Date: \_\_\_\_\_  
 Name and Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Design Verification Record  
(Continued)

20

WBS: 1.2.6  
QA: QA  
Page: 19 of 33

DESIGN PACKAGE TITLE: July Affixing Portion of Package 2C (4th release)

19. DATE: 10/14/94

17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
18 BASEN600-0717-0200-00002	Structural Steel Gate Analysis of a base600-0717-0200-0002 per Attachment II, Page E-7. Assumptions 1 and 2 at the bottom of the page need to be identified in Section 1 Assumptions of the Gate. (28)	Assumption 1 is an input not an assumption. Assumption 2 is an assumption and will be listed in Section 7 Assumption where the analysis is not needed.	Accept 10/27/94

21. REVIEWED BY: [Signature] 10/26/94

22. RESPONSE BY: E.M. Spalden 10/27/94

NMS/M&O

21

### Design Verification Record (Continued)

WBS: 126  
 (13) QA: QA  
 Page: 24 of 35

DESIGN PACKAGE TITLE: ality Affecting Portion of Package 2C (4th release) 15. DATE: 10/14/94

16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
23	BAREAS 000 - 01717-0200 - 00002	Structural Steel Code Analysis BS 1 BAREAS000-01717-0200-00002 Rev 04 Attachment IV, Page IV-5. The assumption that the steel net loading $W$ will be equal to 0.258 needs to be identified in Section 7 "Assumptions" of the test. (u)	ACCEPT. WILL CITE AS AN ASSUMPTION IN SECTION 7 OF THE ANALYSIS WHEN REVISED.	Accepted 10/16/94

21. REVIEWED BY: John W. Friers 10/26/94  
Print Name and Date

22. RESPONSE BY: John H. Pyle 10/27/94  
Print Name and Date

36

**Adverse Condition:** Adequate documentation is not provided describing how the following equations for lateral ground loading on the steel sets were developed:

$e_1$  = soil active pressure (psf)/ft  
 $e_2$  = soil elastic reaction (psf)/ft  
For  $k = 2$      $e_1 = -(0.4803 e_1 - 0.3625 q - 0.719 g)$   
For  $k = 3$      $e_2 = -(0.905 e_1 - 0.739 q - 0.973 g)$   
 $e = e_1 + e_2$  = Total Soil Reaction Pressure

Representatives of the A/E design team were asked how these equations were developed. The design team representatives could not explain how the equations were developed nor could they show documentation as to how they were developed. Furthermore the M&O controls for checking and verification; e.g. discipline and interdiscipline reviews and design verification failed to denote this lack of documentation.

**Recommended Actions:**    Provide documentation showing the development of these equations.

16

CRVMS/M&O

### Design Verification Record (Continued)

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QA: QA  
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14. DESIGN PACKAGE TITLE	15. DATE 10/14/94		16. ACCEPTED
17. COMMENT NO.	18. DOCUMENT SECTION PARAGRAPH	19. COMMENTS	20. RESPONSE
13	BASE RECORD - 01717-0200-00002	<p>18. This analysis states that "the items analyzed in this document are steel sets and accessories used in the TR North trap ground support". This analysis hinges on the premise that items procured by "commercial grade" are to be inspected and provided the inspection and test methodology for doing this. By definition an "engineered item" cannot be "commercial grade". However a review of the M&amp;O steel set procurement drawings discloses that the steel sets are "engineered items". Per the QAB definition Commercial Grade items are those "not subject to design or certification criteria unique to the Program or nuclear facilities used in applications other than the nuclear industry, and ordered from the manufacturer or supplier on the basis of specifications set forth in the manufacturer's published product description." As such while steel set components may in fact be procured as commercial grade and dedicated at the site, fabricated steel sets to the M&amp;O drawings must be procured from a qualified supplier in accordance with QAB requirements and have nothing to do with commercial grade dedication. This analysis fails to make this distinction and infers that the steel sets are procured as commercial grade... They are not.</p>	<p>19. THE MATERIALS DEDICATION ANALYSIS SABER B000-01717-0200-00003 REV03, WILL BE REVISED TO REFLECT:</p> <ol style="list-style-type: none"> <li>1. STEEL SETS ARE AN ENGINEERED ITEM, BUT THAT COMPONENTS AND OF STEEL SETS MAY BE PURCHASED AS COMMERCIAL GRADE ITEMS WHICH MEET QAB DEFINITION</li> <li>2. PURPOSE OF THE ANALYSIS IS TO ESTABLISH CRITICAL AND FUNCTIONAL CHARACTERISTICS OF THE STEEL.</li> <li>3. INSPECTION AND TESTS IDENTIFIED IN THE ANALYSIS MAY BE USED TO ENSURE THE CRITICAL AND FUNCTIONAL CHARACTERISTICS.</li> </ol>
21. REVIEWED BY: John W. Myers		22. RESPONSE BY: John H. De... 10/21/94	10/27/94

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Design Verification Record  
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13. QA: QA

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14. DESIGN PACKAGE TITLE			15. DATE	
Quality Affecting Portion of Package 2C (5th Release)			10/31/94	
16. COMMENT NO.	17. DOCUMENT SECTION/ PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
1	BABEAB000-01717-6300-92344-11/1/94 General 02263	An analysis should be prepared to document the values and engineering decisions used in this specification which are not documented in the already cited analyses. Examples are: 2.01 B. ASTM C150 Type II cement. 2.01 C. Size 7 aggregate 2.01 E2. 15 % silica fume. 2.01 F3 Size of steel fiber 2.02 B. Nozzle slump needs to be identified.	The selection of the materials and the numerical values used in this specification (Wet Process Shotcrete) and the Dry Process Shotcrete Specification are normal and acceptable engineering decisions, and are correct. An analysis will be prepared to document these decisions, to support the engineering traceability. This analysis will explain the selection but will not change the content of these specifications. Therefore the analysis will be made subsequent to the specifications and will not have an impact to these Specifications.	Accept JWP 11/2/94
21. REVIEWED BY:		22. RESPONSE BY:		
John W. Peters <i>JWP</i> Print Name and Sign		Gerald W. Kiefer <i>GWK</i> Print Name and Sign		
11/1/94 Date		11/1/94 Date		

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13 DA. r 10/3/94

14. DESIGN PACKAGE TITLE  
Quality Affirming Portion of Package 2C (5th Release)

16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
21	BABEAB00-01717-6300-03363	<p>Section 1.6.3.2 does not completely address ACI 308 1.4, Section 1.6.3.2, regarding panel construction. The dimensions recommended in the ACI Standard are 762 mm with the third dimension being equal to the dimensions of the structure, but not less than 76 mm. Also it recommends providing the same reinforcement as to the structure or at least half of the panel to use for proper embedment of reinforcing steel. (WS)</p> <p>Retyped for legibility</p> <p>Section 2.02 B does not completely address ACI 308 2.4, Section 1.6.4.2, regarding panel construction. The dimensions recommended in the ACI Standard are 762 x 762 mm with the third dimension being equal to the dimension of the structure, but not less than 76 mm. Also it recommends providing the same reinforcement as in the structure in at least half of the panel to test for proper embedment of reinforcing steel. (WS)</p>	<p>ACI 308 2.4 1.6.3.2 specify that construction panel are 457mm X 457mm. For the preconstruction test panel they state that 762mm X 762mm are to be used and that reinforcement as in the structure is to be in at least one half of the panels. The shotcrete design does not contain reinforcement (deformed bar or welded wire fabric) and the use of 460mm X 460mm has been judged adequate for the preconstruction testing based on the construction test panels size, lack of obstructive reinforcement and embedments and will provide the number of sample cores.</p> <p>This will be addressed in an analysis. Per 1/4/94</p>	<p>Accepted 11/4/94</p>

21. REVIEWED BY: *[Signature]* Date: 11/3/94

22. RESPONSE BY: *[Signature]* Date: 11/4/94

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Design Verification Record  
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14. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (3rd release)		15. DATE 10/31/94	
16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE
5	BABEAB000-01717-6300-03363.1.05.A	Reword to read "Shotcrete: Portland Cement concrete (in accordance with ACI 506.2), pneumatically...."	<p><del>agree will incorporate</del> Jul 11/4/94</p> <p>Disagree - this addition would make the shotcrete to be in full compliance with ACI 506. The selected curing of shotcrete is not in conformance with ACI 506, but is in conformance to tunnel lining practice recommended by various organizations.</p> <p>Will discuss curing in subsequent analysis.</p> <p>Jul 11/4/94</p>

20. ACCEPTED

ACCEPTED  
 MJD  
 11/4/94  
 me

21. REVIEWED BY:  
 Matthew J. Gomez *Matthew J. Gomez* 10/31/94  
 Print Name and Sign Date

22. RESPONSE BY:  
*Jerald H. Kasper* 11/4/94  
 Print Name and Sign Date

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14. DESIGN PACKAGE TITLE Quality Affecting Portion of Package 2C (5th release)		15. DATE 10/31/94
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16. COMMENT NO.	17. DOCUMENT SECTION/PARAGRAPH	18. COMMENTS	19. RESPONSE	20. ACCEPTED
13	BABEAB000-01717-6300-03362. 1.05.A	Reword to read "Shotcrete: Portland Cement concrete (in accordance with ACI 506.2), pneumatically...."	Disagree - this addition would make the shotcrete to be in full compliance with ACI 506. The selected curing of shotcrete is not in conformance with ACI 506, but is in conformance to tunnel lining practice recommended by technical organizations. <sup>Sub 11/4/94</sup> Will discuss the curing in subsequent analysis.	ACCEPT MJA <del>1/4/94</del> 1/4/94

1. REVIEWED BY: Matthew J. Gomez *Matthew Gomez* 11/2/94  
 Print Name and Sign Date

22. RESPONSE BY: *Jerald W. Kasper* 11/4/94  
 Print Name and Sign Date

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YMP-110-R3  
06/20/94

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
DOCUMENT REVIEW RECORD COMMENT SHEET

Page \_\_\_\_\_ of \_\_\_\_\_

1. Document Title: Package 2C3 (part c) - Drawings & Specification Draft/Revision: N/A  Q  
Document Number: N/A Governing Document: N/A Date: N/A  Non Q

2. NO. CODE	3. SECT./ PARA.	4. COMMENT	6. RESPONSE	7. ACCEPT
1. *	45608 41152	These dwgs have a mix of metric and english dimensions that should be all metric. Dwg 45609 is a dwg of similar components, which is done all in metric. Suggest that at the next revision all change all relevant dimensions to Metric.	Agree  10-13-94	Accept BAC 10/13/94

5. Comments B. J. Vecna Date: 10/13/94