



Department of Energy
Yucca Mountain Site Characterization
Project Office
P. O. Box 98608
Las Vegas, NV 89193-8608

WBS 1.2.11
 QA: N/A

AUG 12 1993

Robert F. Pritchett
 Technical Project Officer
 for Yucca Mountain
 Site Characterization Project
 Reynolds Electrical & Engineering Co., Inc.
 P.O. Box 98521
 Las Vegas, NV 89193-8521

EVALUATION OF RESPONSE TO CORRECTIVE ACTION REQUEST (CAR) YM-93-055 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION (YMQAD) AUDIT YMP-93-12 OF REYNOLDS ELECTRICAL & ENGINEERING CO., INC. (SCP: N/A)

The YMQAD staff has evaluated the response to CAR YM-93-055. The response has been determined to be satisfactory. Verification of completion of the corrective action will be performed after the effective date provided. Any extension to this date must be requested in writing, with appropriate justification, prior to the date. Please send a copy of extension requests to Nita J. Brogan, YMQAD/QATSS, 101 Convention Center Drive, Suite 640, Las Vegas, Nevada 89109.

If you have any questions, please contact either Robert B. Constable at 794-7945 or Donald J. Harris at 794-7356.

Richard E. Spence, Director
 Yucca Mountain Quality Assurance Division

YMQAD:RBC-5540

Enclosure:
 CAR YM-93-055

cc w/encl:

- K. R. Hooks, NRC, Washington, DC
- S. W. Zimmerman, NWPO, Carson City, NV
- W. J. Glasser, REECo, Las Vegas, NV

cc w/o encl:

- J. W. Gilray, NRC, Las Vegas, NV
- N. J. Brogan, YMQAD/QATSS, Las Vegas, NV

YMP-5

9308180079 930812
 PDR WASTE
 WM-11 PDR

ADD: Ken Hooks

Wr. Encl.
 11

102.7
 WM-11
 N4103

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

8 CAR NO.: YM-93-055
DATE: 07/02/93
SHEET: 1 OF 2
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document QARD DOE/RW-0333P, Revision 0	2 Related Report No. YMP-93-12
---	-----------------------------------

3 Responsible Organization REECo	4 Discussed With W. Glasser/W. Gratz
-------------------------------------	---

5 Requirement:
QARD DOE/RW-0333P, Section 7.0, Paragraph 7.2.12, Commercial Grade Items

Item B - Supplier evaluation and selection, when determined necessary by the purchaser based on the complexity and importance to safety, shall be in accordance with the requirements of the subsection entitled source evaluation and selection.

(Continued on next page)

6 Adverse Condition:
Contrary to the cited requirements:

Item B - Supplier evaluation to qualify suppliers were not performed for procurement of commercial-grade materials used in work important to radiological safety or waste isolation for Specification YMP-025-1-SP09, Section 02165, Rock Bolts and Accessories, Section 02310, Welded Steel Lattice Girder Ground Support System, and Section 03361, Shotcrete.

D-3 - Testing was not performed on the commercial-grade material to verify the validity of CMTRs furnished by the suppliers (unqualified) of commercial-grade items used in work important to radiological safety or waste isolation for Specification YMP-025-1-SP09, Sections 02165, 02310, and 03361 and tied back to the Technical Inspection Report for traceability.

(Continued on next page)

9 Does a significant condition adverse to quality exist? Yes <u>X</u> No ___ If Yes, Circle One: A B <u>C</u>	10 Does a stop work condition exist? Yes ___ No <u>X</u> ; if Yes - Attach copy of SWO If Yes, Circle One: A B C D	11 Response Due Date: 20 Working Days from Issuance
--	---	--

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

13 Recommended Actions:

1. Qualify suppliers of commercial-grade items contained in specifications or drawings.
2. Identify items with confirmatory testing and provide to A&E.
3. Identify those items not tested and provide to A&E.

7 Initiator <i>Donald J. Harris</i> Donald J. Harris Date <u>6/29/93</u>	14 Issuance Approved by: <i>Whomtable</i> QADD <u>Whomtable</u> Date <u>07-07-93</u>
--	--

15 Response Accepted <i>cl Harris</i> QAR <u>cl Harris</u> Date <u>8/6/93</u>	16 Response Accepted <i>A.C. Spruce</i> QADD <u>A.C. Spruce</u> Date <u>8/11/93</u>
---	---

17 Amended Response Accepted QAR Date	18 Amended Response Accepted QADD Date
---	--

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-93-055
DATE: 07/02/93
SHEET: 2 OF 2
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

5 Requirements (continued)

Item D - After receipt of a commercial-grade item, the purchaser shall ensure that:

3. Inspection or testing is accomplished, to the extent determined by the purchaser to ensure conformance with the manufacturers published requirements.
4. Documentation, as applicable to the item, was received and is acceptable.

6 Adverse Condition (continued)

D-4 - The documentation to the item was not reviewed for acceptance by the purchaser, the documentation was reviewed for accountability and submitted subsequently to the A&E for acceptance on Purchase Orders (POs) 00037YP, 00093, and 01527.

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

CAR NO. YM-93-055
DATE: 08/04/93
PAGE: _____ OF _____
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

CORRECTIVE ACTION RESPONSE for CAR # YM-93-055

Discussions:

Discussion Regarding Item "B"

- As allowed by the paragraph quoted from the Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Requirements and Description (QARD) document, REECo YMP (the purchaser) determined it was not necessary to evaluate and qualify the suppliers of the commercial grade items that were intended for Important to Safety (ITS) or Important to Waste Isolation (ITWI) use. The items identified in the Corrective Action Request (CAR) are simple in nature and are common commercial items. Furthermore, in accordance with QARD, paragraphs 7.2.12, A and C, the approved design output documents (the Title II specification sections referenced in the CAR) identified the items as "commercial grade," and the REECo YMP procurement documents identified the items by the manufacturer's published product description. (The Project specification sections also utilized the manufacturer's product description.)
- REECo YMP also implemented the "acceptable alternative" requirements for commercial grade item acceptance that are stated further on in the referenced QARD paragraph. This was accomplished in accordance with REECo YMP procedure MC-04.2, Receipt Inspection, and documented on the REECo YMP Technical Inspection Report (TIR). All items were inspected for damage (ref. 7.2.12, D, 1); all items were inspected to verify that the item received was the item ordered (ref. 7.2.12, D, 2); to the extent possible, all items were given additional detailed inspections (dimensional, fit-up, etc.) against the manufacturer's information and the Title II Project specification's requirements (ref. 7.2.12, D, 3); and documentation which the Title II specifications required to be furnished with the shipment of the items was verified as received (ref. 7.2.12, D, 4). Further determination of supplier documentation acceptability was accomplished in a parallel review effort under REECo YMP procedure MC-06.2, Control of Supplier Submittals.
- REECo YMP believes the intent of QARD, paragraph 7.2.12, was being met and does not intend to broadly, or as a general practice, evaluate and qualify suppliers of commercial grade items. REECo YMP does recognize that it may be in the Project's best interest to qualify some commercial grade suppliers due to the complexity or importance of the items to be furnished, and in such cases, the company will perform the necessary evaluations and qualifications.

Ltr dtd 8/4/93 - 580-01-587

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

CAR NO. YM-93-055

DATE: 08/04/93

PAGE: _____ OF _____
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

Discussion Regarding Items "D-3" and "D-4"

- REECO YMP (the purchaser) as allowed by the paragraph quoted from the QARD, had determined that the additional detailed inspections accomplished via a TIR (see discussion above) were sufficient to provide for the commercial grade items' item acceptance. As stated in REECO YMP procedure MC-04.2, Receipt Inspection, paragraph 6.4.3, REECO YMP does not use a supplier's Certificate of Conformance/Compliance (C of C) to receipt accept items unless the supplier has been properly evaluated and approved for that function. In the case of the two procurements identified in Attachment A to this CAR response, supplier C of Cs were deliverables which were required by the Title II design specification for delivery to the Architect/Engineer (A/E); however, the C of Cs were not used by REECO YMP as the basis to accept the items.
- REECO YMP does not make any decisions regarding supplier submittal requirements. In all cases regarding Title II design, REECO YMP only passes on the requirements that are stipulated in the Project specifications. REECO YMP does not add to or modify these requirements and, in all cases to date, the supplier submittals have been for A/E use only.
- Certified Material Test Reports (CMTRs), where required by the Title II design specifications, were reviewed for acceptability in accordance with procedure MC-06.2. This review is done to determine that the submittal contains information that complies with the applicable code or standard referenced in the Project specification. MC-06.2 is generally implemented prior to receipt of material. REECO YMP Purchase Orders (POs) typically require the supplier to submit documentation as a separate deliverable prior to shipment of the material. Neither the QARD, paragraph 7.2.12, nor the applicable Title II design specifications require testing to validate a supplier's CMTR. What is required by the QARD, paragraph 7.2.12, D, 4, and paragraph 1.04 of the Project specification sections is a determination that the documentation is acceptable, and this was accomplished per MC-06.2 for all the items in question. Supplier documents that were furnished with the shipment of material have in all cases been copies of what was furnished for review prior to shipment.

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

CAR NO. YM-93-055
DATE: 08/04/93
PAGE: _____ OF _____
CA

CORRECTIVE ACTION REQUEST (Continuation Page)

Discussion Regarding Items "D-3" and "D-4" - Continued

- In regard to traceability of supplier documentation to the received material, REECO YMP does not use the TIR to accomplish this or to provide evidence of traceability. All supplier document submittals and the completed TIRs are collected by the REECO YMP Control Department (CLD) and turned over to the Logistical Support Department Procurement Section which then assembles these documents and copies of the PO into a procurement package. Upon closure of a PO, the procurement package for that PO is turned over to the U.S. Department of Energy as a record package. All necessary traceability is maintained in the procurement package. If special tests are performed by Raytheon Services Nevada Labs for received material, the test reports are attached to the appropriate TIR and included in the package. The same holds true for supplier documentation that accompanies any shipment.

A. Remedial Action:

- REECO YMP has implemented its commercial grade item receipt acceptance program in accordance with the QARD, paragraph 7.1.12, and the applicable Management Control Procedures which conform with the QARD. However, the OCRWM CAR has brought to light some areas of the REECO YMP receipt acceptance methods which are weak and which do not clearly address the issue of "dedicating" commercial grade items for use in ITS or ITWI installations. The following are the remedial actions that REECO YMP will take.
- Receipt inspection/test for material procured from a supplier that is not on the REECO YMP Approved Suppliers List (ASL):

The REECO YMP Quality Assurance Office (QAO) will not approve procurements of commercial grade items that have an ITS or ITWI end use unless the intended supplier is on the REECO YMP ASL or the item's critical characteristics and necessary sampling plan required for "dedication" have been identified by the A/E.

If special laboratory testing is required to dedicate an item, obtaining acceptable test results will be a hold on accepting the material.

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

CAR NO. YM-93-055
DATE: 08/04/93
PAGE: _____ OF _____
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

A. Remedial Action: - Continued

If post-installation testing is the method that is to be used to dedicate a commercial grade item, the material will be conditionally released and full acceptance will be accomplished when the post-installation test is complete. The post-installation testing requirement will be noted on the TIR. The record of post-installation test results will be the field Quality Control Inspection Report with the appropriate TIR number referenced.

Responsible Individual: W. J. Gratza and/or E. P. Bryant
Estimated completion date: Completed

● **Acceptance of material versus acceptance of supplier document submittals:**

TIRs for procurements which require supplier documentation submittals will contain an inspection attribute to verify that supplier document submittals have been found acceptable by REECO YMP under procedure MC-06.2 methods. This inspection attribute will be a hold on accepting the material.

Responsible Individual: W. J. Gratza
Estimated completion date: Completed

● **Traceability:**

Current REECO YMP methods require the applicable PO number and release/shipment number to be entered on the receiving inspection TIR. TIRs will contain, as necessary, a requirement for entering applicable heat, lot, and/or batch numbers of the items received.

Responsible Individual: W. J. Gratza
Estimated completion date: Completed

● **Determination of adequacy of inspections/tests (dedication) performed on material received to date:**

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

CAR NO. YM-93-055

DATE: 08/04/93

PAGE: _____ OF _____
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

A. Remedial Action: - Continued

Although REECO YMP believed it was meeting the intent of QARD, paragraph 7.2.12, and therefore properly dedicating material, the lack of clearly defined critical characteristics in the Project specifications casts some doubt on whether previous receiving inspection/test criteria were adequate. The REECO YMP QAO and the TRW design organization have met a number of times since the OCRWM Quality Assurance audit to determine a course of action to take in regard to the material previously received and accepted. As of the writing of this CAR response, the design organization has indicated that either critical characteristics and dedication methods will be developed for the items listed in Attachment A or the items will be re-evaluated and if possible, reclassified to non-ITS or non-ITWI and that this information will be provided on Field Change Requests (FCRs) against the applicable specification sections.

Upon receiving controlled distribution of the FCRs, REECO YMP QAO will compare the critical characteristics and dedication methods of the FCRs with the receiving acceptance methods employed for the items listed on Attachment A. Two concurrent actions will be taken for material that has not been properly dedicated. The items will be identified and processed on a Nonconformance Report and, if material is available for sampling, appropriate dedication methods will be implemented.

REECO YMP will provide a supplemental CAR response indicating the status of this item by September 15, 1993.

Responsible Individual: W. J. Gratza
Estimated completion date: September 15, 1993

B. Investigative Action:

Identification of the Extent of the Situation in which Commercial Grade Items have been Procured for an ITS or ITWI Use.

- The REECO YMP QAO has reviewed all Title II design procurements that have been made for Job Package 92-20 (1A). A list of the procurements which were for commercial grade items with an ITS or ITWI end use is included in Attachment A. The list also provides a brief summary of each item's source of requirements, documentation requirements, documentation review history, receipt inspection/test requirements, and receipt inspection/test history.

Responsible Individual: W. J. Gratza
Estimated completion date: Completed

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

CAR NO. YM-93-055
DATE: 08/04/93
PAGE: _____ OF _____
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

C. Root Cause Determination:

- The apparent cause of the problem on the part of REECO YMP (the QAO and the CLD) was a lack of understanding that the receipt verification requirements of the Project specification sections may not have been adequate for dedicating commercial grade items for ITS or ITWI use.

D. Corrective Action to Preclude Recurrence:

- All actions which REECO YMP is taking as "remedial actions" will be formally implemented in a revision to procedure MC-04.2, Receipt Inspection, by August 31, 1993. The revision to this procedure will clarify the requirements for acceptance of commercial grade items which are to be used for ITS or ITWI applications.

Responsible Individual: W. J. Gratza
Estimated completion date: August 31, 1993

Response Approved: *W. J. Gratza* Date: 8/4/93

REECO/YMP RESPONSE TO OCRWM CAR NO. YM-93-055

ATTACHMENT A

PROCUREMENT HISTORY OF COMMERCIAL GRADE ITEMS

WITH AN IMPORTANT TO SAFETY

OR IMPORTANT TO WASTE ISOLATION END USE

Index to Procurement History of Commercial Grade Items

Item Number	<u>Description of Commercial Grade Item</u>	REECo/YMP Purchase Order Number	Page
I.	Tunnel Pattern, Solid Core Rock Bolts <i>and Accessories</i>	37-YP-01-3	3
II.	Tunnel Pattern, Hollow Core Rock Bolts <i>and Accessories</i>	1-QYP-01-3	6
III.	Cementitious Grout (for Tunnel Pattern, Hollow Core Rock Bolts)	N/A	9
IV.	Tunnel Lattice Girders <i>and Accessories</i>	93-YP-01-3	11
V.	Tunnel Shotcrete (Fibercrete Brand Name)	1527-CUW-01-2	15
VI.	Tunnel Welded Wire Fabric (for use with Fibercrete)	70-YP-01-3	17
VII.	Tunnel Chain Link Fence (for Test Alcove)	133-YN-01-3	19

I. Solid Core Rock Bolts & Accessories (Tunnel Pattern Rock Bolts) — PO #37-YP-01-3

A. Governing Title II project requirements:

Drawings: MING-MG143; and Sketch SS-M-SK018 (FCR 93/320)

Specifications: SP09, Sec. 02165

B. Supplier documentation submittals:

1. Supplier documentation requirements per Title II specifications

Material test report or certificate of compliance (C of C) per original issue of specification.

C of C per latest specification revision.

2. Supplier documentation requirements per REECo/YMP purchase order

Certified material test reports (CMTR) for each heat of each line item delivered. CMTRs to be furnished within 5 days of contract award and 1 copy to be furnished with each shipment.

3. REECo/YMP review of supplier documentation:

Completed per procedure MC-06.2 and documents submitted to the A/E on 2/9/93, 3/5/93, 3/22/93, and 4/1/93

C. Receiving inspection:

1. Receiving verifications/inspections specified in Title II specifications:

Perform dimensional/visual inspection for conformance to the specification section, inspect for damage, and verify material test reports, per original specification revision.

Perform dimensional/visual inspection for conformance to the specification section and verify material certificates of conformance, per latest specification revision.

2. Receiving inspections performed by REECo/YMP:

Inspection performed by the REECo/YMP Quality Assurance Office Receiving Inspector and documented on Inspection Report No. Y585-93-004. Inspection and/or test criteria employed for the receiving inspection are summarized on the following page(s).

[I, C, 2. Solid Core Rock Bolts & Accessories (Tunnel Pattern Rock Bolts) — PO #37-YP-01-3 - Continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
a. 7/8" dia. X 10' long solid rock bolts. (Furnished under one heat #.)	<p>Inspection: Performed on 4/6/93. Rock bolts were inspected for shipping damage and contamination. Manufacturer's dimensions — length, diameter, and thread size and type — were verified.</p> <p>Test: Performed on 4/6/93. A sample of one rock bolt was tested by Raytheon Labs. Spectrographic analysis was performed.</p>
b. 1/4" X 6" X 6" Plates with center hole . (Furnished under one heat #.)	<p>Inspection: Performed on 4/6/93. Plates were inspected for shipping damage and contamination. Manufacturer's dimensions — plate size, thickness, and hole diameter — were verified.</p> <p>Test: Performed on 4/6/93. A sample of one plate was tested by Raytheon Labs. Spectrographic analysis was performed.</p>
c. 1/4" X 6" X 6" Plates with bevelled center hole. (Furnished under one heat #.)	<p>Inspection: Performed on 4/6/93. Plates were inspected for shipping damage and contamination. Manufacturer's dimensions — plate size, thickness, and hole diameter and bevel — were verified.</p> <p>Test: Performed on 4/6/93. A sample of one plate was tested by Raytheon Labs. Spectrographic analysis was performed.</p>
d. Hardened rock bolt hex nuts. (Furnished under one heat #.)	<p>Inspection: Performed on 4/6/93. Nuts were inspected for shipping damage and contamination. Manufacturer's dimensions — nut size and thread type — were verified. Nuts were run onto one rockbolt to verify compatibility and fit.</p> <p>Test: No lab testing done to date.</p>

[I, C, 2. Solid Core Rock Bolts & Accessories (Tunnel Pattern Rock Bolts) — PO #37-YP-01-3 - Continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
e. Hemispherical washers. (Furnished under one heat #.)	Inspection: Performed on 4/6/93. Washers were inspected for shipping damage and contamination. Manufacturer's dimensions — washer size and hole diameter — were verified. Test: No lab testing done to date.
f. Hardened flat washers. (Furnished under one heat #.)	Inspection: Performed on 4/6/93. Washers were inspected for shipping damage and contamination. Manufacturer's dimensions — washer size and hole diameter — were verified. Test: No lab testing done to date.
g. William's Co. resin cartridge sets. (Furnished under one batch/lot #.)	Inspection: Performed on 4/6/93. Cartridges were inspected for damage, size, and manufacturer markings. Test: No lab testing done to date.

II. Hollow Core Rock Bolts & Accessories (Tunnel Pattern Rock Bolts) — PO #1-QYP-01-3

A. Governing Title II project requirements:

Drawings: MING-MG143; Sketch SS-M-SK012 (FCR 93/254); and Sketch SS-M-SK018 (FCR 93/320)

Specifications: SP09, Sec. 02165

B. Supplier documentation submittals:

1. Supplier Documentation Requirements per Title II Specifications

Material test report or certificate of compliance (C of C) per original issue of specification.

C of C per latest issue of specification.

2. Supplier Documentation Requirements per REECo/YMP Purchase Order

C of C for each line item delivered. C of Cs to be furnished within 5 days of contract award and with each shipment.

3. REECo/YMP review of supplier documentation:

Completed per procedure MC-06.2 and documents submitted to the A/E on 6/10/93.

C. Receiving inspection:

1. Receiving verifications/inspections specified in Title II specifications:

Perform dimensional/visual inspection for conformance to the specification section, inspect for damage, and verify material test reports, per original specification revision.

Perform dimensional/visual inspection for conformance to the specification section and verify material certificates of conformance, per latest specification revision.

2. Receiving inspections performed by REECo/YMP:

Inspection performed by the REECo/YMP Quality Assurance Office Receiving Inspector and documented on Inspection Report No. Y585-93-039. Inspection and/or test criteria employed for the receiving inspection are summarized on the following page(s).

[II, C, 2. Hollow Core Rock Bolts & Accessories (Tunnel Pattern Rock Bolts) — PO #1-QYP-01-3 - continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
a. 1-1/8" dia. X 8' long hollow core rock bolts. (Furnished under one heat #.)	<p>Inspection: Performed on 6/4/93. Rock bolts were inspected for shipping damage and contamination. Manufacturer's dimensions — length, diameter, and thread size and type — were verified.</p> <p>Test: Performed on 6/28/93. A sample of one rock bolt was tested by Raytheon Labs. Spectrographic analysis and tensile strength tests were performed.</p>
b. 1/4" X 6" X 6" plates with center hole and grout tube hole. (Furnished under one heat #.)	<p>Inspection: Performed on 6/4/93. Plates were inspected for shipping damage and contamination. Manufacturer's dimensions — plate size, thickness, and hole diameter and configuration — were verified.</p> <p>Test: Performed on 6/28/93. A sample of one plate was tested by Raytheon Labs. Spectrographic analysis was performed.</p>
c. 1/2" X 8" X 8" Plates with center hole and grout tube hole. (Furnished under one heat #.)	<p>Inspection: Performed on 6/4/93. Plates were inspected for shipping damage and contamination. Manufacturer's dimensions — plate size, thickness, and hole diameter and configuration — were verified.</p> <p>Test: Performed on 6/28/93. A sample of one plate was tested by Raytheon Labs. Spectrographic analysis was performed.</p>
d. Threaded rock bolt couplings. (Furnished under one heat #.)	<p>Inspection: Performed on 6/4/93. Couplings were inspected for shipping damage and contamination. Manufacturer's dimensions — coupling size and thread type — were verified. Couplings run onto one rockbolt to verify compatibility and fit.</p> <p>Test: Performed on 6/28/93. A sample of one coupling was tested by Raytheon Labs. Spectrographic analysis was performed.</p>

[II, C, 2. Hollow Core Rock Bolts & Accessories (Tunnel Pattern Rock Bolts) — PO #1-QYP-01-3 - continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
e. Hardened rock bolt hex nuts. (Furnished under one heat #.)	Inspection: Performed on 6/4/93. Nuts were inspected for shipping damage and contamination. Manufacturer's dimensions — nut size and thread type — were verified. Nuts run onto one rockbolt to verify compatibility and fit. Test: Performed on 6/28/93. A sample of one nut was tested by Raytheon Labs. Spectrographic analysis was performed.
f. Bevelled washers. (Furnished under one heat #.)	Inspection: Performed on 6/4/93. Washers were inspected for shipping damage and contamination. Manufacturer's dimensions — washer size and hole diameter — were verified. Test: Performed on 6/28/93. A sample of one washer was tested by Raytheon Labs. Spectrographic analysis was performed.
g. Hardened flat washers. (Furnished under one heat #.)	Inspection: Performed on 6/4/93. Washers were inspected for shipping damage and contamination. Manufacturer's dimensions — washer size and hole diameter — were verified. Test: Performed on 6/28/93. A sample of one washer was tested by Raytheon Labs. Spectrographic analysis was performed.
h. William's Co. "Wil-Kwik-Set" rock bolt grout. (Furnished under one batch/lot #.)	Inspection: Performed on 6/4/93. Grout containers were inspected for shipping damage and contamination. Container markings, product ID, etc. and proper sealing of lids were verified. Test: No lab testing done to date.

III. Cementitious Grout (For Tunnel Pattern Rock Bolts) — No PO

A. Governing Title II project requirements:

Drawings: Sketch SS-M-018 (FCR 93/320)

Specifications: SP09, Sec. 02165

B. Supplier documentation submittals:

1. Supplier Documentation Requirements per Title II Specifications

Material test report or certificate of compliance (C of C) per original issue of specification.

C of C per latest revision of specification.

2. Supplier Documentation Requirements per REECo/YMP internal material request

REECo C of C with each shipment for each lot/batch.

3. REECo/YMP review of supplier documentation:

No record of REECo/YMP completing per procedure MC-06.2.

C. Receiving inspection:

1. Receiving verifications/inspections specified in Title II specifications:

Perform dimensional/visual inspection for conformance to the specification section, inspect for damage, and verify material test reports, per original specification revision.

Perform dimensional/visual inspection for conformance to the specification section and verify material certificates of conformance.

2. Receiving inspections performed by REECo/YMP:

Inspection performed by the REECo/YMP Quality Assurance Office Receiving Inspector and documented on Inspection Report No. Y586-93-002. Inspection and/or test criteria employed for the receiving inspection are summarized on the following page(s).

[III, C, 2. Cementitious Grout (For Tunnel Pattern Rock Bolts) — No PO - Continued]

Item

Receipt Inspections and/or Tests Performed

HLN (CC) dry-mix grout
Mixed by REECo using Army Corps of
Engineers design.
(Furnished under multiple batches & shipments.)

Inspection: Being continuously performed. First receipt inspection done on 5/11/93. Shipping containers are inspected for damage and possibility of moisture intrusion. Dry grout is inspected for moisture contamination. Batch/lot numbers are verified.

Test: No lab testing done during or for receipt verification; however, compressive strength testing is being performed on a regular and continuous basis during construction batch. Samples are being taken on each work shift and being tested for compressive strength. All pull tests are being performed on the installed and grouted in-place rock bolt assemblies where HLN(CC) is used.

IV. Tunnel Lattice Girders & Accessories — PO #93-YP-01-03

A. Governing Title II project requirements:

Drawings: Sketches SS-M-SK006 and SS-M-011 (FCR 93/280)

Specifications: SP09, Sec. 02310

B. Supplier documentation submittals:

1. Supplier Documentation Requirements per Title II Specifications

No supplier documentation submittals were required in the advanced Title II specification provided and approved for procurement.

Certified test reports for reinforcement steel, certification of welders' qualifications, and C of C for bolts per the latest approved and issued specification revision.

2. Supplier Documentation Requirements per REECo/YMP Purchase Order

None specified in original PO. Documents required by the latest specification revision were obtained by request after PO had been completed.

3. REECo/YMP review of supplier documentation:

Completed per procedure MC-06.2 and documents submitted to the A/E on 4/21/93 and 6/11/93.

C. Receiving inspection:

1. Receiving verifications/inspections specified in Title II specifications:

None required by the original or latest specification revisions.

2. Receiving inspections performed by REECo/YMP:

Inspection performed by the REECo/YMP Quality Assurance Office Receiving Inspector and documented on Inspection Report No. Y585-93-016
Inspection and/or test criteria employed for the receiving inspection are summarized on the following page(s).

[IV, C, 2. Tunnel Lattice Girders & Accessories — PO #93-YP-01-3 - continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
a. 14'-9" radius crown arch segment. (*)	<p>Inspection: Performed on 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment arc and cord dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>
b. 14'-9" radius top & bottom rib arch segments. (*)	<p>Inspection: Performed on 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment arc and cord dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>
c. 12' long leg segment. (*)	<p>Inspection: Performed on 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment cross-section and length dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>
d. 16'-3" radius crown arch segment. (*)	<p>Inspection: Performed on 4/8/93 and 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment arc and cord dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>

[IV, C, 2. Tunnel Lattice Girders & Accessories — PO #93-YP-01-3 - continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
e. 16'-3" radius top & bottom rib arch segments. (*)	<p>Inspection: Performed on 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment arc and cord dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>
f. 15' long leg segment. (*)	<p>Inspection: Performed on 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment cross-section and length dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>
g. 5' long crown wallplate segment. (*)	<p>Inspection: Performed on 4/8/93 and 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment cross-section and length dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>
h. 5' long springline wallplate segment. (*)	<p>Inspection: Performed on 4/30/93. Segments were inspected for shipping damage and contamination. Manufacturer's dimensions and configuration — rebar sizes, segment cross-section and length dimensions, mtg. plate locations, sizes and thicknesses, mtg. plate hole diameters and configuration, etc. — were verified.</p> <p>Test: No lab testing done to date.</p>

[IV, C, 2. Tunnel Lattice Girders & Accessories — PO #93-YP-01-3 - continued]

<u>Item</u>	<u>Receipt Inspections and/or Tests Performed</u>
i. 3/4" dia. ASTM A-325 bolts. (Furnished under three heat #s.)	Inspection: Performed on 4/8/93 and 4/30/93. Bolts were inspected for shipping damage and contamination. Bolt diameters and manufacturer's markings were verified. (Markings were also compared to the counterfeit bolt list.) Test: No lab testing done to date.
j. ASTM A-194 hex nuts for the above A-325 bolts (Furnished under three heat #s.)	Inspection: Performed on 4/8/93 and 4/30/93. Nuts were inspected for shipping damage and contamination. Nut sizes, diameters and manufacturer's markings were verified. Nut to bolt fit-up verified by running nuts onto bolts. Test: No lab testing done to date.
(*) Note: These segments are welded assemblies consisting of A-36 plates and either three or four rebar members. No. 6 and No. 10 rebar were the only sizes used in the construction of the various segments. All A-36 plate steel was from one heat, all No. 6 rebar was from one heat, and all No. 10 rebar was from one heat.	

V. Shotcrete ("Fibercrete" Brand Name, For Use In The Starter Tunnel) — PO #1527-CUW-01-2

A. Governing Title II project requirements:

Drawings: MING-MG121; MING-MG123; MING-MG143; and Sketch SS-M-SK032 (FCR 93/404)

Specifications: SP09, Sec. 03361

B. Supplier documentation submittals:

1. Supplier Documentation Requirements per Title II Specifications

Mix design, test mix compressive strength test results, and material test reports for cement, aggregate and admixtures and/or C of Cs for cement aggregates, admixtures, steel fibers, and curing compounds.

2. Supplier Documentation Requirements per REECo/YMP Purchase Order

Cement mill analysis report, steel fiber mill certifications, and sand (aggregate) certified test results.

3. REECo/YMP review of supplier documentation:

Completed per procedure MC-06.2 and documents submitted to the A/E on 3/1/93, 3/22/93, 3/29/93, 4/12/93 5/5/93, 5/13/93, 6/10/93, and 6/29/93.

C. Receiving inspection:

1. Receiving verifications/inspections specified in Title II specifications:

Perform dimensional/visual inspection of cement, aggregates, and admixtures and verify material test reports.

Perform dimensional and/or visual inspection of packaging and marking and verify material test reports.

2. Receiving inspections performed by REECo/YMP:

Inspection performed by the REECo/YMP Quality Assurance Office Receiving Inspector and documented on Inspection Report No. Y585-93-026
Inspection and/or test criteria employed for the receiving inspection are summarized on the following page(s).

[V, C, 2. Shotcrete ("Fibercrete" Brand Name, For Use In The Starter Tunnel) — PO #1527-CUW-01-2 - Continued]

Item

Receipt Inspections and/or Tests Performed

Fibercrete, dry, ready mixed in 1 cubic yard bags.
(Furnished in various batches under 1 PO.)

Inspection: Being continuously performed. First receipt inspection was done on 4/2/93. Each bag is inspected for shipping damage and contamination. Bag seals are verified to be intact and not breached. Bag markings are verified to be in accordance with PO requirements.

Test: No lab tests are done for receiving verification: however, compressive strength br tests are done on samples taken from test panels made during each construction work sh

8

[VI, C, 2. Welded Wire Fabric (For Use With Tunnel Shotcrete) — PO #70-YP-01-3 - Continued]

Item

Receipt Inspections and/or Tests Performed

6" X 6" - W2.9 X W2.9 - 6' X 150'
welded wire (fence) fabric.
(All fencing manufactured with wire
made from 1 heat #.)

Inspection: Performed on 4/6/93. Each roll of wire fabric was inspected for shipping damage and contamination. Manufacturer's dimensions — wire gage, mesh size, wire protrusion beyond edges, and fabric length and width — were verified. Also, fabric was inspected for ASTM maximum allowable broken welds per wire and per roll.

Test: Performed on 4/7/93. A sample of the wire was tested by Raytheon Labs. spectrographic analysis was performed.

VII. Chain Link Fencing (Test Alcove) ---- PO #133-YN-01-3

A. Governing Title II project requirements:

Drawings: MING-MG128

Specifications: SP09, Sec. 02165

B. Supplier documentation submittals:

1. Supplier Documentation Requirements per Title II Specifications

Material test reports per original issue of the specification.

Certificate of conformance per the latest specification revision.

2. Supplier Documentation Requirements per REECo/YMP Purchase Order

CMTR within 5 days of contract award and 1 copy of the CMTR with the shipment.

3. REECo/YMP review of supplier documentation:

Completed per procedure MC-06.2 and documents submitted to the A/E on 5/7/93.

C. Receiving inspection:

1. Receiving verifications/inspections specified in Title II specifications:

Perform dimensional/visual inspection for conformance to the specification section, inspect for damage, and verify material test reports, per original specification revision.

Perform dimensional/visual inspection for conformance to the specification section and verify material certificates of conformance.

2. Receiving inspections performed by REECo/YMP:

Inspection performed by the REECo/YMP Quality Assurance Office Receiving Inspector and documented on Inspection Report No. Y585-93-010. Inspection and/or test criteria employed for the receiving inspection are summarized on the following page(s).

[VII, C, 2. Chain Link Fencing (Test Alcove) — PO #133-YN-01-3 - Continued]

Item

Receipt Inspections and/or Tests Performed

2" X 2" (mesh) - 9 ga. wire - 6' X 50'
chain link fencing.
(All fencing manufactured with wire
made from 1 heat #.)

Inspection: Performed on 6/23/93. Each roll of fencing was inspected for shipping damage and contamination. Manufacturer's dimensions — wire gage, mesh size, wire bends at edges, and fencing length and width — were verified.

Test: Performed on 6/24/93. A sample of the wire was tested by Raytheon Labs. Spectrographic analysis and tensile strength tests were performed.