

QUALITY ASSURANCE MANUAL

TO

ANSI/ASQC STANDARD Q9001

Revision 7

LIGO-C950498-07-B

Includes Updates of:

23 July 1997

2 September 1997

3 October 1997

3 December 1997

18 March 1998



July 23, 1997

DOCUMENT TRANSMITTAL

**Changes for Index Revision 13
QAP's for ANSI/ASQC Standard Q9001**

**TO: Larry K. Jones
California Institute of Technology
Controlled Copy Number - 201**

FROM: R. E. Shelton - Houston CQA

Attached is the summary of the changes for the latest QAP revisions issued to you earlier this month. If you are required to be trained or to train someone else in these QAP's, this index may aid in that training.

Acknowledgment receipt of this summary is not required.

If you have any questions, call Robert Shelton (713) 896-3729

Regards,

R. E. Shelton

cc: RWK/JCJ/1113-2-1 (Distribution)

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

The following QAP's have been revised. Except for those QAP's that are new or extensively revised, a documented review of this summary sheet for the revised QAP's by the applicable individuals may be used for their indoctrination/training to these QAP's.

QAP 1.1 Rev. 6

1. Deleted "reports to" in all paragraphs.
2. Added "Construction Technology" and corrected "Corporate Welding & QA Technologies" in 2.2.
3. Added 2.6.5 to "General Manager Corporate Welding & QA Technologies"
4. Deleted "President Chicago Bridge & Iron Technical Services Company" and added "Vice-President Engineering, Fabrication and Logistics" as new 2.3 and Vice-President Engineering" as new 2.9.
5. Deleted "Purchasing Manager" and added "Corporate Procurement Manager" as new 2.5 and "Purchasing" as new 2.16.
6. Added "Manager Construction Technology" as new 2.8.
7. Changed "Chief Engineer" to Vice-President Technology" in 2.10.
8. Added 2.11.10 through 2.11.13 for "Engineering Manager".
9. Reorganized the "Contract Development Manager's" duties in 2.14.1 through 2.14.6.
10. Combined "Manufacturing Manager" and "Construction Manager" in 2.15.
11. Added "Component Supply Team" as new 2.17.
12. Changed "Contract Team Leader" to "Project Manager" and added 2.18.14 through 2.18.18.
13. Added 2.19.4 for "Construction Supervisor".
14. Added 2.20.5, 2.20.6, 2.20.7 for "Superintendent (or Foreman)".
15. Added 2.21.5 through 2.21.9 for "Welding & QC Manger".
16. Added 2.22.8 to "Welding & QC Supervisor".

QAP 1.2 Rev. 2

This QAP indicates that the procedure was extensively revised. Most of the changes were editorial (i.e., changed Contract Team Leader back to Project Manager, changed shall to will, used acronyms AIA and AI where possible, clarified that Engineering-Assigned transmits data reports to the AI through the shop Schedule Coordinator or the Project Manager, etc.).

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 2.1 Rev. 4

1. Added 2.3 concerning CB&I Standards and work instructions.
2. Changed 3.2.1 to be the same as the QAM for the contents of Contract Addenda.
3. Moved "Quality Plans" to a new 3.4 and more clearly defined their use.
4. Added a descriptive use of CB&I Standards to renumbered 3.5.
5. Changed "Special Process" to "welding, NDE and PWHT" in renumbered 3.6.1(A).
6. Changed "Contract Team Leader" to "Project Manager" in 3.6.2.
7. Added "Work Instructions" as new 3.7.
8. Added "work instructions" to renumbered 4.0 and changed "electronic format" to "as on-line-documentation (OLD)".

QAP 2.2 Rev. 4

1. Changed "Contract Team Leader" to "Project Manager" in 3.1 and 3.2.
2. Changed "he" to "the Welding & QC Manager" in 3.2.
3. Clarified the use of quality plans in 3.3.
4. Removed "customer's 3rd party" in 3.4 and 3.7.
5. Added new 3.8 concerning distribution of quality plans by the Welding & QC Manager.
6. Added "by the Welding & QC Manager" to end of 4.0.

QAP 2.3 Rev. 4

1. Changed "Contract Team Leader" to "Project Manager" in 2.1.
2. Added "Contract" to "QAPs" in 2.2 and 4.0.
3. Added new 3.2 concerning distribution of Contract QAPs by the Welding & QC Manager.
4. Added "by the Welding & QC Manager" to 4.0.

QAP 2.4 Rev. 0

Minor change to 3.1(1) eliminating arrows.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 3.1 Rev. 5

1. "Responsibilities" 2.0 and "Distribution of Pre-Contract Documents" 3.1 have been completely rewritten.
2. Clarified first sentence in 3.2.1 by adding "by the Contract Team in order to".
3. Clarified first sentence in 3.3.1 by adding "Contract Team Member (Product Definition Specialist)" and deleted "fabrication and installation".
4. Changed "Construction Manager or Manufacturing Manager" to "Project Manager or other Responsible Contract Team Member(s)" in 3.3.2.
5. Added "both fabrication and installation" to end of 3.3.2(B).
6. Changed "Responsible Management" to "Responsible Contract Team Leader" in 3.3.3.
7. Paragraphs 3.3.4 and 3.3.5 concerning the proposal have been completely rewritten.
8. Added a new 3.4 concerning the on-line Contract Folder.
9. Added "on-line Contract Folder" to 4.0.

QAP 3.2 Rev. 5

1. Added "to conform the on-line Contract Folder for the contract and control subsequent customer changes" to end of 1.0.
2. "Responsibilities" 2.0 and "Contract Documents and Conforming the On-line Contract Folder" 3.1 have been completely rewritten.
3. Changed "Contract Team Leader" to "Project Manager" in 2.2, 3.2.1, 3.2.2, 3.2.3, 3.2.4 & 4.0.
4. Changed "those executing the contract" to "the Contract Team" in 3.2.1.
5. Changed "Each Manager or designated personnel" to "The Project Manager and the responsible Contract Team Member(s)" in 3.2.2.
6. Changed "comments" to "changes" in 3.2.3.
7. Deleted existing 3.2.4.
8. Added new 3.2.4 and 3.2.5 concerning contractual changes.
9. Added the "Contract Folder" and "change log" as internal records to 4.0.

QAP 4.1 Rev. 6

1. Deleted "Emergency Change Notices" from title and body of procedure.
2. Deleted "written" from "written requisition" in title and body of procedure.
3. Added 3.5 and 3.6 concerning emergency changes to drawings.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 4.2 Rev. 3

1. Changed "Contract Team Leader" to "Project Manager" in renumbered 3.2 and 3.3.3.
2. Moved 3.3 and 3.5 to 3.1 and 3.2, respectively.
3. Moved 3.1, 3.2, 3.4 and 3.6 to 3.3.1, 3.3.2, 3.3.3 and 3.3.4, respectively.
4. Included Schedule Coordinator in 3.2, 3.3.2 and 3.3.3.
5. "Safety Relief and Venting for ASME Vessels" reworded and moved to 3.4.

QAP 5.1 Rev. 5

1. Added "and data" to 1.1.
2. Included "Contract Addenda and Contract QAPs", "Quality Plans", "Customer Drawings" and "Process Control Documents and Testing Instructions" in 1.2.
3. Changed "Contract Team Leader" to "Project Manager" in 2.0 and renumbered 6.2.
4. Added "Electronic Files" to 3.1(A).
5. Clarified "On-line Documentation (OLD)" in 3.1(B) and renumbered 3.4.
6. Added new 3.2 concerning "Master List".
7. Added new 3.3 concerning "Design Output".
8. Clarified forms in renumbered 3.5.
9. Added new section 4.0 on "Receipt".
10. Added new section 5.0 on "Acknowledgment Receipt".
11. Clarified the distribution and control of documents in renumbered section 6.0.
12. Added "Records" in new 7.0.
13. Added the "POT" as Attachment 1 under 8.0.

QAP 5.2 Rev. 5

1. Deleted "Emergency Change Notices" from title and body of procedure.
2. Deleted "written" from "written requisition" in title and body of procedure.
3. Changed QAP reference from QAP 5.6 to QAP 5.1 in 1.0.
4. Added responsibilities of Project Manager in 2.2.
5. Deleted last sentence of renumbered 3.1 concerning computer printouts.
6. Deleted POT in renumbered 3.2 and old 6.2 and 7.2 and added it to QAP 5.1.
7. Changed "Contract Team Leader" to "Project Manager" in renumbered 3.2 and 3.4.
8. Deleted 3.1.3, 3.1.4, 3.1.5, 3.1.6 and 4.4.
9. 3.1.7, 3.1.8 and 3.1.9 renumbered to 3.3, 3.4 and 3.5.
10. Clarified procurement specifications in 5.0.
11. Added 6.3 and 6.4 into 6.0.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 5.3 Rev. 2

This procedure has been extensively revised.

QAP 5.4 Rev. 6

1. Minor editorial changes made to 1.0, 2.1, 2.2, 3.1, 4.0 and renumbered 3.2.
2. Changed "Contract Team Leader" to "Project Manager" in 2.2.
3. Deleted 3.2, 3.2.1, 3.3, 3.4, 3.5, 4.2 and 4.3.
4. Clarified old 3.2.2 as 3.3 concerning distribution of Contract QA Documents.

QAP 5.5 Rev. 4

Changed "Contract Team Leader" to "Project Manager" throughout procedure.

QAP 5.6 Rev. 2

This procedure has been extensively revised.

QAP 6.1 Rev. 7

This procedure has been extensively revised.

QAP 6.2 Rev. 4

1. Added "Project Manager" along with "Purchasing" in 2.1, 3.1 and 4.0 and renumbered 3.2, 3.3.1, 3.3.8 and 3.3.9.
2. Deleted 2.4 and 3.2.
3. Minor editorial changes made to 2.1, 2.2, 2.3 and renumbered 3.3.1, 3.3.4 and 3.4.2

QAP 6.3 Rev. 5

1. Added "Project Manager" along with "Purchasing" in 2.0 and 3.1.
2. Minor editorial changes made to 3.1(A), 3.1(B), 3.1(D), 3.1(E), 3.1(F), 3.1(G) and 3.3.
3. Changed 3.1(J) concerning "approved" suppliers being listed on another CB&I database.
4. Deleted second sentence of 4.0 since already covered in 2.0.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 6.4 Rev. 2

This procedure has been extensively revised.

QAP 7.1 Rev. 5

1. Changed "Contract Team Leader" to "Project Manager" in 2.2, 3.1.2 and 3.3.1.
2. Added requirement for receiving inspection report to end of 2.3.
3. Added release of acceptable items to end of 2.4.
4. Deleted release of customer supplied items by Purchasing from 2.5.
5. Added requirement for filling in RIR and added reference to CB&I Standard 607-3-3.
6. Added that inspection may be documented on customer documents to 3.2.1(D) & (E).
7. Added new 3.2.1(F) concerning release of acceptable items and what to do with an unacceptable item.
8. Clarified that records were customer documentation and any RIR's.

QAP 7.2 Rev. 2

1. Changed "Contract Team Leader" to "Project Manager" in 2.2, 3.2(B) and 3.4.
2. Added reference to RIR to 2.5 and 3.2.
3. Changed reference in 3.2 to paragraph 3.3 of QAP 10.1.
4. Added new 3.2(C)(5)&(6). Moved old 3.2(C)(5) into 3.2(C)(6).
5. Incorporated 3.2(D) into 3.2(C)(6).
6. Incorporated 3.2(E) into 3.2(D).
7. Deleted 3.2(F).
8. Added new 3.4 concerning nonconformities.

QAP 8.1 Rev. 4

This procedure has been extensively revised.

QAP 9.1 Rev. 5

This procedure has been extensively revised.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 9.2 Rev. 7

1. Changed "Purchasing Manager" to "Purchasing" in 2.2 and 3.3.
2. Added new 2.4 for Superintendent responsibilities.
3. Changed "vendor" to "supplier" in 3.1.1.
4. Deleted "written" from "written requisitions" in 3.3.
5. Deleted most wording in 3.4 and referred to QAP 10.1 for the receiving inspection of welding materials.
6. Expanded wording in 3.5 for the release of welding materials.
7. Added "(Foreman)" after "Superintendent" in 3.7.1 and 6.1.
8. Deleted customer's 3rd party inspection in 4.2(C) and 5.2.3.
9. Deleted reference to Article AD-900, Division 2 and changed "Record Drawing" to "Process Control Drawing" in 6.3.2.
10. Added ASME Section VIII wording to 6.4 for tack welds.
11. Removed words in middle part of paragraph of 7.2.

QAP 9.3 Rev. 5

1. Added reference to CB&I Standard 732 to 2.2.
2. Changed "contract drawings" to "detail drawings" in 3.3.
3. Added the Welding & QC Manager's concurrence to 3.5.1.
4. Changed wording in last sentence of 3.6 to be consistent with 4.1.
5. Changed "vendor" to "subcontractor" in 4.1. Changed "will" to "shall" in three places in 4.1. The revision mark for these changes was forgot.

QAP 9.4 Rev. 4

1. Changed "Contract Team Leader" to "Project Manager" in 2.1 and 2.2.
2. Editorial changes to 3.1, 3.2.2, 3.4(A), 3.4(F)
3. Added "standards" to 3.2.3 and 5.0.
4. Made 3.2.4 and 3.2.5 as subparagraphs of 3.2.3.
5. Added 3.2.3(d) concerning customer approval.
6. Added reference to QAP 5.1 and QAP 5.6 to 3.3.
7. Changed title of 4.0 and start of 4.0 to "Work Instructions".
8. Added reference to QAP 2.4 to end of 4.0.
9. Deleted last sentence in 5.0.

QAP 10.1 Rev. 7

This procedure has been extensively revised.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 10.2 Rev. 6

This procedure has been extensively revised.

QAP 10.3 Rev. 5

1. Changed "Contract Team Leader" to "Project Manager" in 2.0.
2. Added "detail" to "drawings" and added "design output" in 3.1.1.
3. Changed "Purchasing Manager" to "Purchasing or Shop QC", "assuring" to "verifying" and "purchasing related records" to "procurement related records" in 3.1.2.
4. Deleted "Record Drawings and Checklists" from 3.1.3(A).
5. Added "PWHT and Testing Charts" to 3.1.3(B).
6. Deleted "3rd party" from 3.2.1.
7. Made first paragraph of 4.0 as 4.1 and added "the completion of a final inspection checklist form" to the end.
8. Made first sentence of second paragraph of 4.0 as 4.2.
9. Made second sentence of second paragraph of 4.0 as 4.3 and added "by the Welding and QC Manager" to the end.

QAP 10.4 Rev. 4

This procedure has been extensively revised.

QAP 12.1 Rev. 4

1. Changed "checklists" to "process control documents" in 2.0 and 3.1.5.2(A).
2. Editorial changes to 3.1.5, 3.1.5.2(B) and 3.1.5.2(C).
3. Changed "3rd party" to "AI" in 3.1.5.1(D).
4. Deleted sentence under 3.1.5.2.
5. Changed "checklists, quality plans, record drawings, etc." to "process control documents" in 4.2.

QAP 13.1 Rev. 6

1. Deleted 4.1(B) and 4.3 and clarified in 4.1 that AI concurrence is required prior to making repairs by welding to pressure retaining material.
2. Changed "vendor" to "supplier" in 5.0.
3. Changed "Purchasing Manager" to "Purchasing or Project Manager" in 5.0 and 5.0(B).

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 14.1 Rev. 4

Changed "Contract Team Leader" to "Project Manager" in 2.2, 2.3, 3.2, 4.1 and 5.2.

QAP 15.1 Rev. 4

Changed "Contract Team Leader" to "Project Manager" in 2.2 and 8.0.

QAP 16.1 Rev. 5

Changed "Contract Team Leader" to "Project Manager" in 3.9.1 and 3.9.2.

QAP 16.2 Rev. 2

1. Deleted parenthetical statement in 2.2(1) and added "or National Board Registration forms" at end.
2. Added "Supplier Partial Data Reports" as new 2.2(2) and added "Nameplate Drawings", "General Plan Drawing" and "Material Specifications" as (10), (11) and (12).
3. Changed "Purchasing Manager" to "Purchasing" in 3.1.

QAP 17.1 Rev. 6

1. Added "locations and Corporate Procurement" after "Engineering" in 3.1.
2. Changed "purchasing" to "procurement" in 3.2.
3. Added "designated" before "Welding & QC Manager" in 6.1.1.
4. Changed titles of personnel in table on page 5 and added "Audits with Procurement Related Findings" to table
5. Changed "Audit Finding" form on page 8.

QAP 18.1 Rev. 5

This procedure has been extensively revised.

QAP 18.2 Rev. 2

This procedure has been extensively revised.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 13

QAP 19.1 Rev. 4

1. Changed "Inspector" to "AI" in 2.1, 2.2, 2.3, 2.4.4, renumbered 2.7.3, renumbered 2.7.4, 3.1.5
2. Editorial changes to 2.3, 2.4, 2.4.1, 2.5, 2.6, 3.2.3, 3.2.6, 3.2.7 and renumbered 3.3.3, 3.3.4 and 3.3.5.
3. Deleted 2.6(C)&(D), 2.7 and 3.3.
4. Reworded completely 3.1.1 through 3.1.4 concerning Engineering-Assigned responsibilities for nameplates, stamps and National Board Forms R-1 and R-2.
5. Changed "Shop Welding & QC Manager" to "Designated Welding & QC Manager (NBIC Certificate Holder)" in 3.2, renumbered 3.3.4, renumbered 3.3.5 and 4.2.
6. Removed "Construction" from "Construction Welding & QC Manager" in renumbered 3.3.

QAP 19.2 Rev. 0

New procedure for API-510 Repairs and Alterations

R. E. Shelton
Houston CQA



Return to: Chicago Bridge & Iron
P. O. Box 41146
Houston, TX 77241-1146
Attn: R. E. Shelton
Houston CQA

September 2, 1997

DOCUMENT TRANSMITTAL

**Quality Assurance Manual (QAM) and Quality Assurance
Procedures (QAP's) for ANSI/ASQC Standard Q9001 (ISO 9000)**

**TO: Larry K. Jones
California Institute of Technology
Controlled Copy Number - 201**

FROM: R. E. Shelton - Houston CQA

Attached is the current Quality Assurance Manual and QAP's for ANSI/ASQC Standard Q9001 (ISO 9000).

The current QAM is Revision 7 (8/13/97) and the current QAP's are controlled by the "Index for CB&I Quality Assurance Procedures", Revision 14 (8/28/97).

Also attached is the "Summary of QAM Changes - Revision 6 to Revision 7" and the "QAP Changes for Index Revision 14".

Acknowledge receipt of these documents by signing below and returning one copy of this transmittal to R. E. Shelton (Houston CQA) by 10/2/97. If you wish, you may respond by E-Mail. When using E-Mail, please be sure to refer to the copy number(s) you received.

If you have any questions, call Robert Shelton or Ron Kruzic.

SIGNATURE

9/16/97

DATE

cc:

RWK/JCJ/1113-2-1 (Distribution)
F/U: 10/2/97

**Summary of QAM Changes
QAM to ANSI/ASQC Standard Q9001
Revision 6 to Revision 7**

<u>Page/Paragraph</u>	<u>Changes</u>
Section 1.0	Changed title of "Vice President of Operations" to "Vice President Sales & Operations" in 1.2 and on page 3.
Section 1.0	Moved organization below "Vice President Engineering, Fabrication & Logistics" to new page 4.
Section 1.0	Changed title of "Corporate Procurement Manager" to "Vice President Procurement" on new page 4 and renumbered pages 5 & 6.
Section 1.0	Added "Vice President Area Director of Marketing" on page 3.
Section 1.0	Deleted "General" from "General Manager Corporate Welding & QA Technologies" on page 3 and renumbered pages 5 & 6.
Section 1.0	Added "President CBI Company Ltd." to page 3.



QUALITY ASSURANCE MANUAL

TO

ANSI/ASQC STANDARD Q9001

REVISION 7
DATE 8-13-97

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QUALITY ASSURANCE MANUAL
TO
ANSI/ASQC STANDARD Q9001

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Authorized *Ronald W. Hoyer* Date 8/28/97
Corporate QA Manager



1.0 MANAGEMENT RESPONSIBILITY

1.1 Scope

This section describes management responsibility, authority and interrelationships.

1.2 Responsibility and Authority

The President of CB&I has overall responsibility and authority for all work. The responsibility and authority for execution of individual projects is delegated to the presidents of CB&I subsidiaries. The president of each subsidiary works with the Vice President of Engineering and the Vice President of Sales & Operations in order to execute all aspects of a project. See organizational charts on pages 3, 4, 5 & 6 of Section 1.0. Specific responsibilities for each member of the management team are described in a QAP.

1.3 Resources

Managers shall identify resource requirements applicable to their work and shall provide sufficient and appropriate resources including trained personnel for the work.

1.4 Management Representative

1.4.1 The Corporate QA Manager is the Management Representative and has the authority and responsibility for implementation, maintenance and improvement of CB&I's QMS. The Corporate QA Manager has the organizational freedom and authority to:

1. initiate action to prevent the occurrence of nonconformities;
2. identify and document any quality problems;
3. initiate, recommend or provide solutions to problems;
4. verify the implementation and performance of solutions;
5. control further use of nonconforming materials and products until the deficiency or unsatisfactory condition has been resolved.



QUALITY ASSURANCE MANUAL
TO
ANSI/ASQC STANDARD Q9001

SECTION 1.0
PAGE 2 of 6
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1.5 Management Review

The Corporate QA Manager shall review QMS/QAM on an ongoing basis to ensure its continued suitability and effectiveness in satisfying the requirements of ANSI/ASQC Standard Q9001-1994 and the QAM Statement of Policy. Methods of determining this include: a thorough review of the results of internal audits, NCRs, CARs, warranty and customer complaints. The Corporate QA Manager documents the results of management reviews annually to the President of CB&I.

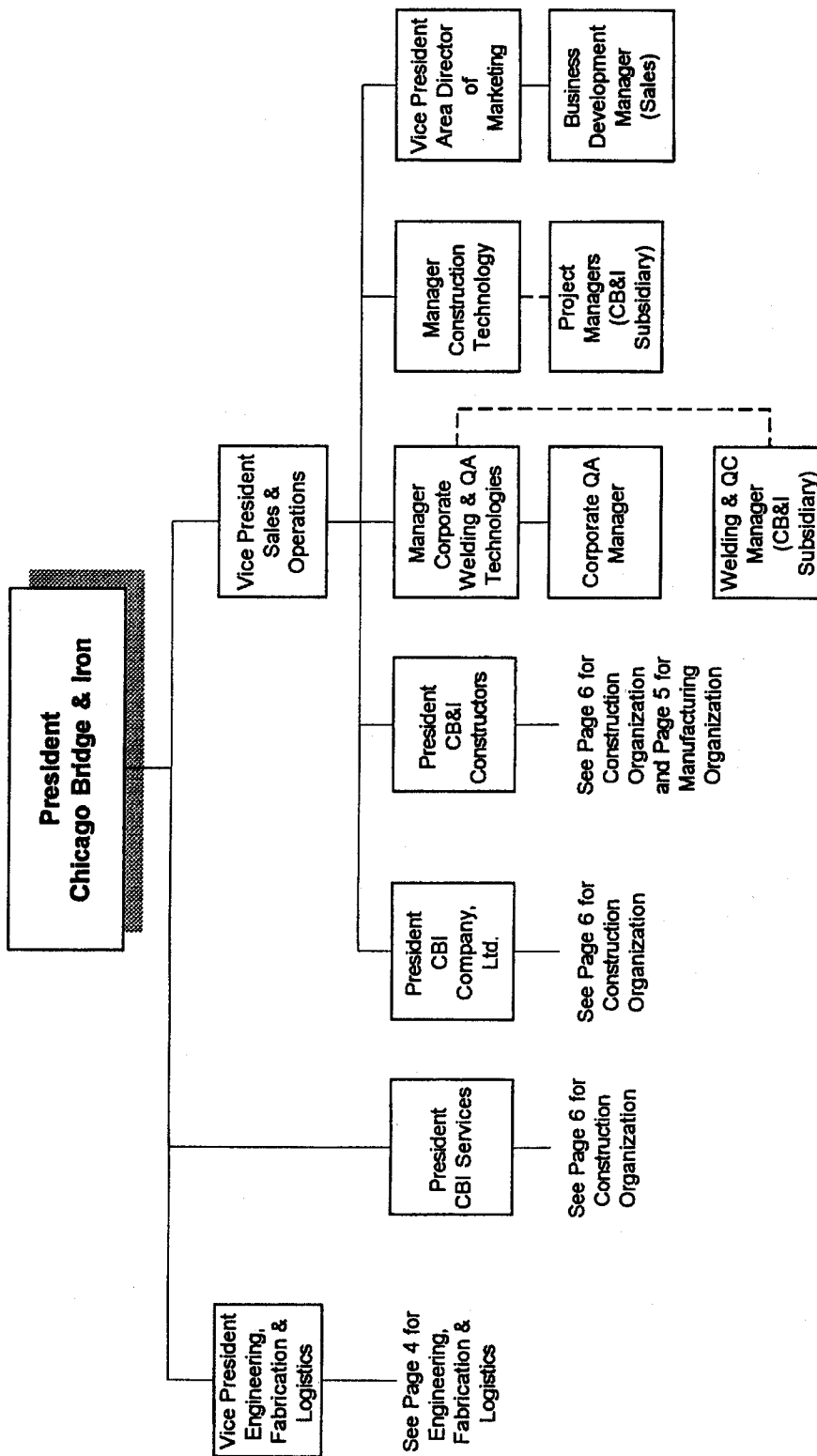
1.6 Delegation

Managers may delegate functions to qualified individuals to act for them, however they shall retain overall responsibility for implementation of the function delegated.



QUALITY ASSURANCE MANUAL
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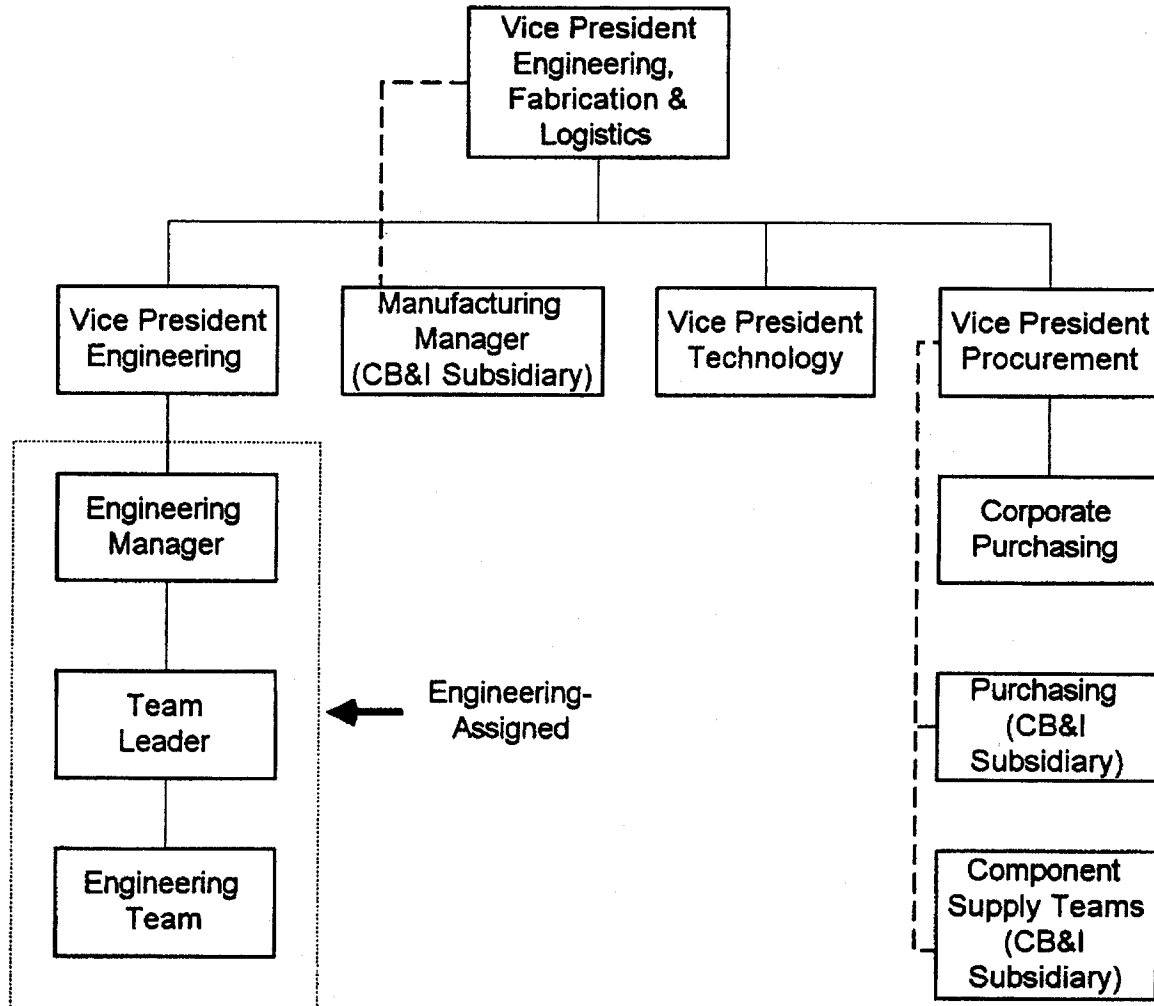
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-----Indicates Technical Authority



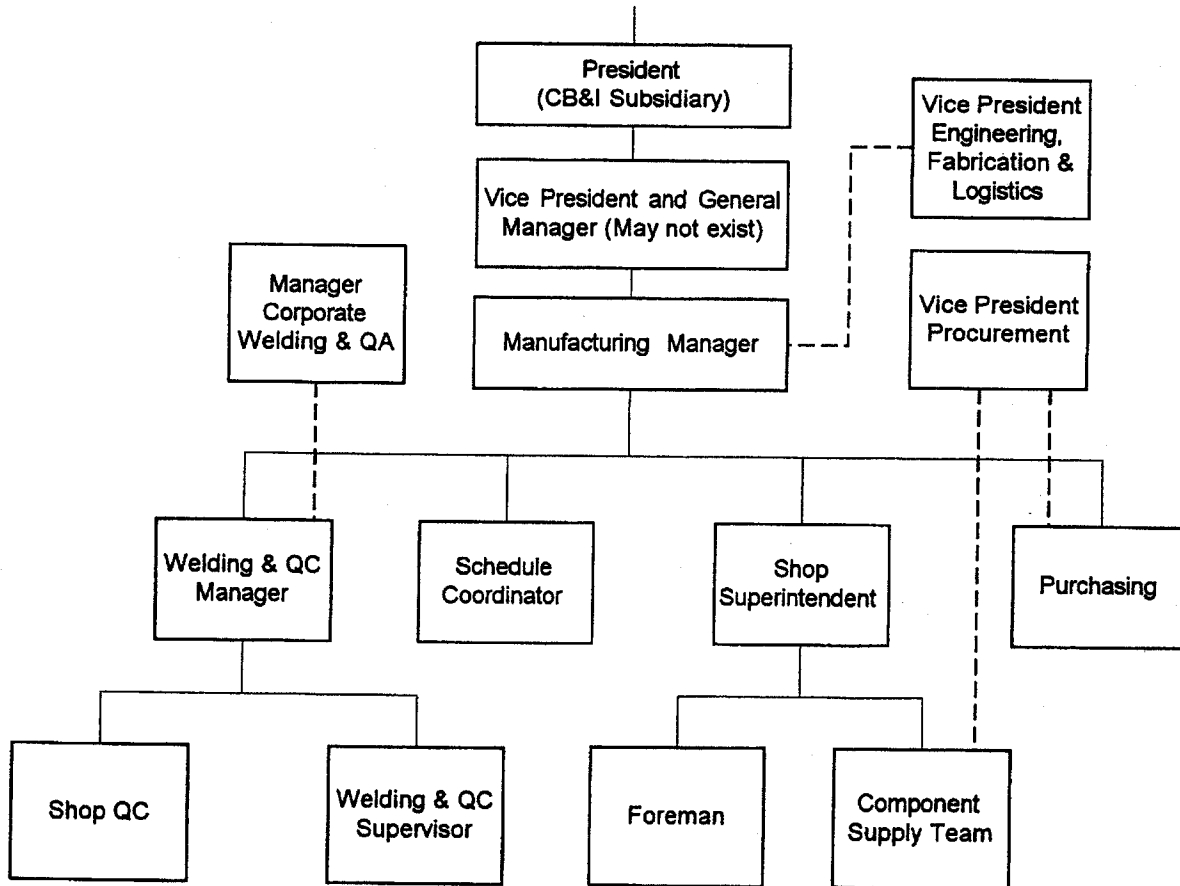
ENGINEERING, FABRICATION & LOGISTICS





MANUFACTURING ORGANIZATION

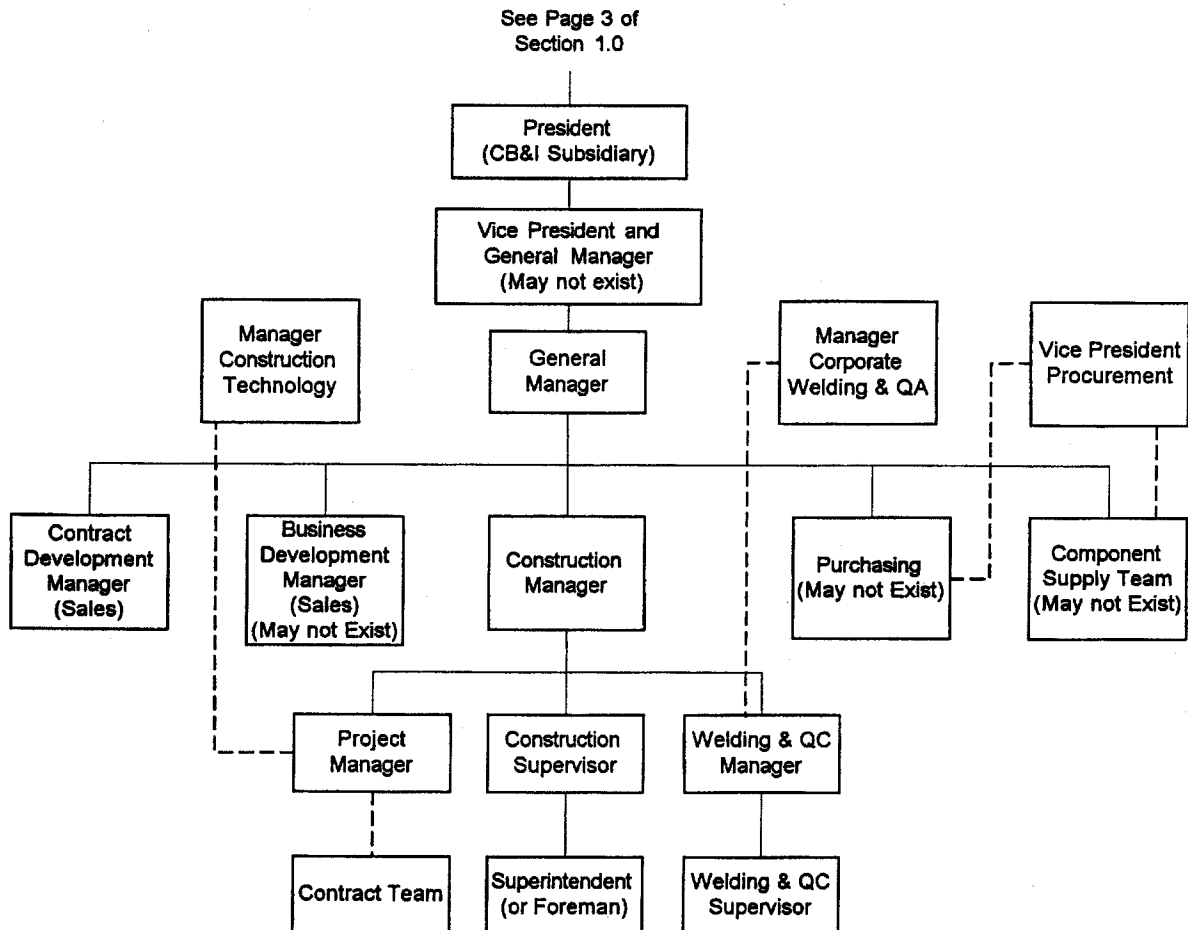
See Page 3 of
Section 1.0



----- Denotes Technical Authority



CONSTRUCTION ORGANIZATION



----- Denotes Technical Authority

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 14

The following QAP's have been revised. Except for those QAP's that are new or extensively revised, a documented review of this summary sheet for the revised QAP's by the applicable individuals may be used for their indoctrination/training to these QAP's.

QAP 1.1 Rev. 7

1. Changed title of "Vice President Operations" to "Vice President Sales & Operations" in 2.2.
2. Changed title of "Corporate Procurement Manager" to "Vice President Procurement" in 2.5.
3. Added "Vice President Area Director of Marketing" as new 2.6.
4. Deleted "General" from "General Manager Corporate Welding & QA Technologies" in renumbered 2.7.

R. E. Shelton
Houston CQA

INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

+	Addition
-	Deletion
*	Revision
∅	Documentation
∠	Index Correction

SECTION 1 MANAGEMENT RESPONSIBILITY

* QAP 1.1	Rev. 7	Management Responsibility
QAP 1.2	Rev. 2	Authorized Inspectors (AI)

SECTION 2 QUALITY SYSTEM

QAP 2.1	Rev. 4	Quality System
QAP 2.2	Rev. 4	Quality Plan
QAP 2.3	Rev. 4	Contract QAPs
QAP 2.4	Rev. 0	Work Instructions

SECTION 3 CONTRACT REVIEW

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R. E. Shelton

Houston CQA

Aug. 28, 1997

Date



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 CONTRACT

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APPROVED	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	BY	DATE
	JH	BGG		LBR	AGR	CMD	JCV	PREPARED REK
							REVISED RWK	8-13-97
							AUTHORIZED <i>RWK 8/28/97</i>	
							REFERENCED	
							STANDARD --- REV. NO. -	

1.0 SCOPE:

The purpose of this procedure is to describe the responsibilities of Managers. Managers may delegate functions to qualified personnel to act for them but retain overall responsibility for implementation of the requirement.

2.0 RESPONSIBILITIES:

- 2.1 PRESIDENT CHICAGO BRIDGE & IRON CO: Responsible for all CB&I operations.
- 2.2 VICE PRESIDENT SALES & OPERATIONS: Responsible for policy and standards, product development, product and process change management and Corporate Sales & Operations (includes Corporate Welding & QA Technologies and Construction Technology).
- 2.3 VICE PRESIDENT ENGINEERING, FABRICATION AND LOGISTICS: Responsible for engineering, fabrication and logistics (procurement) activities.
- 2.4 PRESIDENT (CB&I SUBSIDIARY): Responsible for all CB&I Subsidiary operations.
- 2.5 VICE PRESIDENT PROCUREMENT: Responsible for all CB&I procurement and purchasing policy and guidelines.
- 2.6 VICE PRESIDENT AREA DIRECTOR OF MARKETING: Responsible for all CB&I Sales Policy and Guidelines.
- 2.7 MANAGER CORPORATE WELDING & QA TECHNOLOGIES: Responsibilities include:
 - 2.7.1 QA, Welding, Calibration and NDE Policy.



- 2.7.2 Content and qualification for welding, heat treating and NDE procedures.
- 2.7.3 Weld Lab operations.
- 2.7.4 Training of personnel for welding, welding supervision, NDE, heat treating and repair and maintenance of welding equipment.
- 2.7.5 Maintenance of the Corporate Calibration Program and NDE Program.

2.8 CORPORATE QA MANAGER: Responsibilities include:

- 2.8.1 Controlling contents and distribution of the QAM and QAPs.
- 2.8.2 Assuring that appropriate QA procedures are generated, reviewed and approved.
- 2.8.3 Monitoring and auditing of quality related activities.
- 2.8.4 Evaluation and implementation of corrective action.
- 2.8.5 Coordinating and controlling QA related functions.
- 2.8.6 Conducting and reporting the annual Management Review.

2.9 MANAGER CONSTRUCTION TECHNOLOGY: Responsibilities include:

- 2.9.1 Construction policy and guidelines.
- 2.9.2 Preparation and maintenance of equipment and erection manuals.
- 2.9.3 Training of personnel for construction techniques.
- 2.9.4 Special lifting procedures.



- 2.10 **VICE PRESIDENT ENGINEERING:** Responsible for all activities of Engineering including coordinating the activities of engineering groups with the President (CB&I Subsidiary).
- 2.11 **VICE PRESIDENT TECHNOLOGY:** Responsible for design policy and guidelines.
- 2.12 **ENGINEERING MANAGER:** Responsibilities include:
- 2.12.1 Review and distribution of customer specifications and requirements within Engineering.
 - 2.12.2 Review and approval of customer and supplier design calculations.
 - 2.12.3 Preparation, review and acceptance of design calculations.
 - 2.12.4 Preparation and distribution of procurement specifications.
 - 2.12.5 Overseeing the preparation, review and approval of detail drawings.
 - 2.12.6 Preparation and distribution of process control documents.
 - 2.12.7 Preparation and distribution of requisitions.
 - 2.12.8 Preparation of pressure and vacuum test procedures.
 - 2.12.9 Review and approval of venting requirements.
 - 2.12.10 Review and approval of special and non-furnace heat treating procedures.
 - 2.12.11 Preparation of Manufacturers Data Reports, Partial Data Reports and National Board forms.
 - 2.12.12 Assembly and distribution of Pressure Vessel Booklets (PVB).



- 2.12.13 Controlling National Board Registration numbers.
- 2.13 GENERAL MANAGER (FACILITY OR SUBSIDIARY): Responsible for Customer Service, Contract Development, Project Managers, local purchasing and component supply teams and jobsite activities.
- 2.14 BUSINESS DEVELOPMENT MANAGER (BDM) (Sales): Responsible for obtaining contracts.
- 2.15 CONTRACT DEVELOPMENT MANAGER (CDM) (Sales): Responsibilities include:
- 2.15.1 Identifying customer and code requirements during pre-contract review.
 - 2.15.2 Assembling the Contract Team.
 - 2.15.3 Preparation of the proposal and the on-line Contract Folder.
 - 2.15.4 Reviewing the contract prior to signing by the BDM to assure that it reflects all that was agreed to by CB&I and the customer.
 - 2.15.5 Conforming the on-line Contract Folder with the signed contract.
 - 2.15.6 Distribution of contracts documents.
- 2.16 MANUFACTURING/CONSTRUCTION MANAGER: Responsibilities at assigned facility include:
- 2.16.1 Production and QC activities.
 - 2.16.2 Providing guidance for Welding & QC, local purchasing, component supply and production personnel.



- 2.16.3 Ensuring that manufacturing/construction equipment is maintained.
- 2.16.4 Scheduling workloads to utilize available resources efficiently.
- 2.16.5 Reviewing contracts and assigning personnel for contract execution.

2.17 **PURCHASING:** Responsibilities include:

- 2.17.1 Purchasing goods and services in accordance with information supplied by Engineering, Welding & QC Manager or other Responsible Management.
- 2.17.2 Assisting in the disposition of rejected material.
- 2.17.3 Reviewing and approving suppliers of goods and services.
- 2.17.4 Maintaining the supplier database.
- 2.17.5 Reviewing receiving and inspection reports, material certifications (MTRs and COCs) and, if required, releasing material for use.
- 2.17.6 Resolving supplier nonconformances.

2.18 **COMPONENT SUPPLY TEAM:** Responsibilities include:

- 2.18.1 Processing requisitions for the sourcing of materials and items.
- 2.18.2 Determining the sourcing (internal vs external) of fabricated items.
- 2.18.3 Specifying for internal fabrication if material is to be supplied from stock or to be purchased.



2.19 **PROJECT MANAGER:** Responsibilities include:

- 2.19.1 Planning and managing the execution of all work activities for one or more projects.
- 2.19.2 Establishing and maintaining lines of communications with the customer.
- 2.19.3 Monitoring and reporting progress to all involved parties.
- 2.19.4 Upon completion of the contract, transmitting to the customer any records or data required to be submitted.
- 2.19.5 Leading the cross-functional contract team.
- 2.19.6 Coordinating the activities of all departments concerned with assigned projects.
- 2.19.7 Assisting in planning and scheduling.
- 2.19.8 Negotiating and accepting changes (Change Log) to the contract and distributing these to CB&I departments.
- 2.19.9 Coordinating all contractual matters with the customer.
- 2.19.10 Assuming the responsibilities of the Welding & QC Manager if none is assigned to the contract.
- 2.19.11 Assuring that documentation and work is completed and performed correctly.
- 2.19.12 The preparation of contract procedures.
- 2.19.13 Managing warranty and Customer complaints.
- 2.19.14 Maintenance of the on-line Contract Folder.
- 2.19.15 Reviewing and approving construction subcontractors.



- 2.19.16 Maintaining the Construction Subcontractor Database.
- 2.19.17 Resolving subcontractor nonconformancies.
- 2.19.18 Control and distribution of customer drawings.
- 2.20 **CONSTRUCTION SUPERVISOR**: Responsibilities include:
 - 2.20.1 Developing and maintaining the Detailed Construction Plan (DCP).
 - 2.20.2 Providing guidance for the Superintendent.
 - 2.20.3 Assisting jobsite and customer needs.
 - 2.20.4 Monitoring construction subcontractors.
- 2.21 **SUPERINTENDENT (OR FOREMAN) (SHOP OR JOBSITE)**: Responsibilities include:
 - 2.21.1 Supervising production work performed on one or more contracts.
 - 2.21.2 Assuring job safety.
 - 2.21.3 Coordinating production activities with those of quality control.
 - 2.21.4 Assuming the responsibilities of the Welding & QC Supervisor if none is assigned to the contract.
 - 2.21.5 Preparation of Shop Work Orders.
 - 2.21.6 Material Identification and its maintenance.
 - 2.21.7 Receiving inspections and, if required, releasing material for use.
- 2.22 **WELDING & QC MANAGER**: Responsibilities include:
 - 2.22.1 Controlling QC activities at assigned locations.



- 2.22.2 Coordinating controls relating to welding including preparation of welding, heat treatment and NDE procedures and welding material specifications.
 - 2.22.3 Assuring that appropriate QC procedures are generated, reviewed and approved, when required.
 - 2.22.4 Assuring the product is completed in accordance with this quality system. This is the responsibility of the designated Welding & QC Manager (ASME/NBIC certificate holder).
 - 2.22.5 Generating contract addenda, contract QAPs and Quality Plans.
 - 2.22.6 Qualification and maintenance for welders and NDE personnel.
 - 2.22.7 Monitoring heat treatments and pressure/vacuum tests.
 - 2.22.8 Maintaining the National Board R-Form Log. (NBIC Certificate Holder).
 - 2.22.9 Controlling Code Symbol Stamps (ASME/NBIC Certificate Holder)
- 2.23 **WELDING & QC SUPERVISOR:** Responsibilities include:
- 2.23.1 Assuring that trained personnel perform and evaluate tests and examinations.
 - 2.23.2 Assuring that processes, examinations and testing conform to the contract procedures and Code requirements.
 - 2.23.3 Assuring the customer and AI are provided the opportunity to review process control documents, and have the opportunity to witness examinations, tests and reports.



DOC. ID QAP 1.1
REV. NO. 7
CONTRACT

TITLE MANAGEMENT RESPONSIBILITY

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-
- 2.23.4 Assuring that jobsite receiving inspections are performed and material is identified.
 - 2.23.5 Instructing welders concerning the implementation of welding procedures to be used.
 - 2.23.6 Assuring that records and nonconformities are properly handled.
 - 2.23.7 Assuring that current drawings are in use.
 - 2.23.8 Assuring that welding materials are properly used and stored.



Return to: Chicago Bridge & Iron
P. O. Box 41146
Houston, TX 77241-1146
Attn: R. E. Shelton
Houston CQA

October 3, 1997

DOCUMENT TRANSMITTAL

**Quality Assurance Manual (QAM) and Quality Assurance
Procedures (QAP's) for ANSI/ASQC Standard Q9001 (ISO 9000)**

**TO: Larry K. Jones
California Institute of Technology
Controlled Copy Number - 201**

FROM: R. E. Shelton - Houston CQA

Attached is the current Quality Assurance Manual and QAP's for ANSI/ASQC Standard Q9001 (ISO 9000).

The current QAM is Revision 8 (9/11/97) and the current QAP's are controlled by the "Index for CB&I Quality Assurance Procedures", Revision 15 (9/22/97).

Also attached is the "Summary of QAM Changes - Revision 7 to Revision 8" and the "QAP Changes for Index Revision 15".

Acknowledge receipt of these documents by signing below and returning one copy of this transmittal to R. E. Shelton (Houston CQA) by 10/31/97. If you wish, you may respond by E-Mail. When using E-Mail, please be sure to refer to the copy number(s) you received.

If you have any questions, call Robert Shelton or Ron Kruzic.


SIGNATURE

10/9/97
DATE

cc:
RWK/JCJ/1113-2-1 (Distribution)
F/U: 11/3/97

**Summary of QAM Changes
QAM to ANSI/ASQC Standard Q9001
Revision 7 to Revision 8**

<u>Page/Paragraph</u>	<u>Changes</u>
Section 0.4	Changed definition of "Heat Coding". Added definition of "Material and Items" and "Unique Material Identification".
Section 8.0	Added "Unique Material Identification" to 8.2.5.
Section 8.0	Added "delivery" to 8.2.3 and 8.2.5.



QUALITY ASSURANCE MANUAL

TO

ANSI/ASQC STANDARD Q9001

REVISION 8
DATE 9-11-97

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Authorized Ronald W. Kruger Date 9/15/97
Corporate QA Manager



GLOSSARY

ACCEPT, ACCEPTANCE, ACCEPTED, APPROVAL, APPROVE, APPROVED

Acknowledge, by signoff, that a document or activity has been evaluated and confirmed to meet stated requirements.

ACKNOWLEDGMENT RECEIPT

A letter of transmittal, print order and transmittal (POT) or electronic return receipt that is used to confirm the recipient received the documents transmitted.

AS NECESSARY/WHEN NECESSARY

Decision is a matter of judgment.

AS REQUIRED/WHEN REQUIRED

Decision is contained in codes, CB&I Standards, CB&I instructions or Quality Assurance Procedures, or customer documents.

ASSEMBLY CHECKLIST (PROCESS CONTROL DRAWINGS)

A process control document used, when required, to control operations for assemblies and parts requiring welding, heat treating or nondestructive examinations and which is also used to document welder ID to the joint welded, location and identity of radiographs taken and, when required, material ID of each piece or assembly.

AUTHORIZATION

The signoff, on a document, of the individual who confirms that internal review and approval of the document was completed and all comments were resolved.

AUTHORIZED INSPECTOR (AI)

An employee of an ASME accredited Authorized Inspection Agency with which CB&I has an agreement to supply inspection services required by ASME and NBIC.

CB&I IDENTIFICATION

The CB&I material identification system which is used to relate items to individual detail drawings so that they can be properly identified during fabrication and installation.

CB&I STANDARDS

A series of documents (commonly referred to as Red Book Standards) issued with the full authority of CB&I Management. These Standards contain proprietary information and shall not be copied or distributed outside of CB&I.



CODE

The code(s) or national/industry standard(s) specified in the customer documents, for design, fabrication and installation.

CONSTRUCTION

The organization that performs fabrication and/or installation, located at the field site.

CONSTRUCTION SUBCONTRACT

A subcontract issued to a supplier by the Project Manager for work to be performed on a CB&I field site.

CONTRACT FOLDER

An in-house compilation of information in an on-line database obtained from the customer and other documents and used by CB&I to plan the execution of the contract and develop the specific documents needed to execute the work.

CUSTOMER DOCUMENTS

Design specifications, design drawings and instructions sufficient for establishing the basis for fabrication and/or installation.

DESIGN CALCULATIONS

A set of calculations which establish product adequacy, provide a basis for ordering and identification of material and justify contract drawing release for use.

DESIGN INPUT

Information obtained from code, statutes, regulations and customer documents.

DESIGN OUTPUT

Design calculations, design sketches, stress analyses or other forms of written communication which define product configuration and size, and identify material specifications.

DETAIL DRAWINGS

Engineering drawings that show the details required for materials, fabrication and installation. Also drawings that contain quality assurance or documentation requirements. Does not include record drawings, cutting sketches, loading diagrams, shop template drawings, etc.

DETAILED CONSTRUCTION PLANS

Process control instructions used to control construction operations by providing detailed descriptions of erection methods, sequencing and techniques.



DOCUMENT

Hard copy or electronic record such as manuals, procedures, process control documents and reports.

ELECTRONIC RECORD

Information or data stored in a form that only a computer can read or process.

ENGINEERING-ASSIGNED

The Engineering group responsible for design and detail activities.

FIELD SITE

The owner's location or at a temporary intermediate site required for assembly of parts to be installed at the final, permanent field location.

HEAT CODING

A CB&I identification (number, letter or color) assigned to material or an item to maintain traceability in lieu of using the original supplier's identification.

HOLD POINT

A point in which work may not proceed until the individual or agency requesting the hold releases it.

MANUFACTURING

The organization that performs fabrication or shop assembly located at a permanent CB&I facility (SHOP).

MASTER LIST

An index or summary sheet that lists documents and data by their identification and revision status.

MATERIAL AND ITEMS

All-inclusive generic terms used to describe the constituents that are procured, fabricated and assembled to complete a structure (i.e., plate, forgings, pipe, castings, valves, gaskets, structural, nuts, bolts, studs, washers, etc.).

PROCEDURE

A document that specifies or describes how an activity is to be performed. It may include methods to be used, equipment to be used, sequence of operations, personnel requirements and acceptance criteria.

PROCESS CONTROL DOCUMENTS

Documents, such as record drawings, process control drawings, assembly checklists, inspection and testing checklists, erection manuals, written instructions, etc., used to control fabrication and installation processes.



PROCESS CONTROL DRAWING

See "Assembly Checklist"

PROCUREMENT DOCUMENT

A purchase order, subcontract or contract used to purchase goods and services.

PROCUREMENT SPECIFICATIONS

Specifications for items and services, which include all the technical and quality assurance requirements needed by a supplier.

QUALITY

Totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs.

QUALITY PLAN

A document setting out the specific quality practices, resources, and sequence of activities relevant to a particular product, project or contract.

RECORD

A document in hard copy or electronic (floppy, compact disk, harddisk, etc.) form used to record permanent information or data.

RECORD DRAWING

A process control document used to record welder ID to the joint welded, location and identity of radiographs taken and, when required, the material ID of each piece or assembly.

REQUISITIONS

Bills (advance or final), shipping orders or instructions that contain all the technical and quality assurance information needed for procurement.

RESPONSIBLE MANAGEMENT

Management individual with direct responsibility for performing activities.

REVIEW

Evaluation for the purpose of acceptance or rejection.

SIGNOFF

The dated (month/day/year), written signature or written initials of an individual for hardcopy documents or the dated mark or symbol traceable to an individual for electronic documents.



SUPPLIER

A company supplying goods or services.

SUPPLIER DATABASE

An information system that lists all suppliers classified by CB&I, the supplier's relevant credentials, capabilities, experience, performance measures and a CB&I contact person.

SURVEY

A documented evaluation of a supplier's ability to meet subcontract requirements as verified by a determination of the adequacy of the supplier's quality system and by a review of the implementation of that system at the location of the work.

TRACEABILITY

The ability to verify the history, location or application of an item by means of recorded identification.

UNIQUE MATERIAL IDENTIFICATION

A CB&I identification (alpha/numeric) assigned to material or an item to maintain traceability in lieu of using the original supplier's identification.

USE-AS-IS

A disposition that does not violate any code statutory/regulatory requirements. This disposition may require technical justification which may involve reconciliation with the design.

WELDERS

Welders and welding operators.

WELDING MATERIALS

Coated electrodes, filler metals, fluxes, welding studs and consumable inserts.

WITNESS POINT

A point in which work may proceed providing prior notification was given to the individual or agency requesting the witness point.

WORK INSTRUCTIONS

Detailed departmental procedures used to ensure the completion of a task or operation.



WORK ORDERS

Process control instructions used to control shop operations by specifying the routing of items through specific operations, machines or departments.

ASME	- American Society of Mechanical Engineers
CAR	- Corrective Action Request
COC	- Certificate of Compliance
GWPS	- General Welding Procedure Specification
ID	- Identity
MS	- Material Specification
MTR	- Material (Manufacturer's) Test Report (may be referred to as CMTR or CTR)
NBIC	- National Board Inspection Code
NCR	- Nonconformance Report
NDE	- Nondestructive Examination
PO	- Purchase Order
POT	- Print Order and Transmittal
PQR	- Welding Procedure Qualification Record
PWHT	- Post Weld Heat Treatment
QAM	- Quality Assurance Manual
QAP	- Quality Assurance Procedure
QMS	- Quality Management System
RIR	- Receiving Inspection Report
SRSCCL	- Shop Release for Shipment Check List
UMID	- Unique Material Identification
WMS	- Weld Material Specification
WMT	- Weld Material Testing Specification
WPQ	- Welder Performance Qualification Test
WPS	- Welding Procedure Specification



8.0 PRODUCT IDENTIFICATION AND TRACEABILITY

8.1 Scope

This section describes the system used to control the identification and traceability of material and items during fabrication, delivery and installation.

8.2 Identification and Traceability of CB&I Supplied Products

8.2.1 Detailed drawings, procurement specifications and requisitions identify the material and items required on a contract.

8.2.2 The assignment (application) of material and items for a contract is recorded on requisitions.

8.2.3 Material and items are marked, tagged or labeled with a CB&I identification so that they can be properly identified throughout the fabrication, delivery and installation processes.

8.2.4 Traceability requirements for material and items for a contract are specified on requisitions.

8.2.5 When traceability is required, either the original supplier's identification is maintained or transferred or the material or item is marked, tagged or labeled with a CB&I heat coding or unique material identification and documented. This allows traceability to be maintained throughout the fabrication, delivery and installation processes.

8.3 Identification and Traceability of Customer Supplied Products

See Section 7.0 for identification requirements. When traceability is required, the CB&I system shall be used.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 15

The following QAP's have been revised. Except for those QAP's that are new or extensively revised, a documented review of this summary sheet for the revised QAP's by the applicable individuals may be used for their indoctrination/training to these QAP's.

QAP 4.1 Rev. 7

1. Editorial change to 1.0.
2. Removed revisions and emergency changes and added to QAP 5.1.
3. Removed cold forming requirements and added to QAP 6.1.

QAP 5.1 Rev. 6

1. Added new 3.1 and 3.2 concerning document format.
2. Added new 3.6.1 and 3.6.2 concerning control of On-Line-Documentation (OLD).
3. Added 6.0 Revisions and 7.0 Emergency Changes from QAP 4.1.

QAP 6.1 Rev. 8

1. Editorial changes to 2.3, 2.4, 2.6, 3.1, 3.2, 3.5, 3.5.1, 3.7(A), 3.7(C), 4.2.4(A), 4.2.4(D) and 5.3(A).
2. Added new 3.3 and 3.4 concerning handling of requisitions.
3. Added cold forming requirements as new 3.5.1 (d) & (e) from QAP 4.1.

QAP 7.2 Rev. 3

1. Editorial changes to 1.0, 1.1, 1.2, 2.1, 2.3, 2.4 and 3.2(D).
2. Deleted 1.3. QAP 19.1 must be followed for NBIC (needs no repetition).
3. Added typical specified documentation to 2.2 as new 2.2.1, 2.2.2 and 2.2.3.

QAP 8.1 Rev. 5

1. Added definition of "material traceability coding" as new 2.0.
2. Editorial changes to renumbered paragraphs 3.2, 4.1, 4.2, 4.5, 4.6.1, 4.6.3 and 5.0.
3. Added material traceability codings or UMID to renumbered paragraphs 3.5, 4.5 and 4.6.1.

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 15

QAP 8.2 Rev. 0

1. New procedure for unique material identification.

QAP 9.2 Rev. 8

1. Changed 6.3.1 concerning welder identification per ASME Code requirement.

QAP 18.1 Rev. 6

1. Added new 5.0 "Training Guidelines" concerning training individuals in the QAM and QAP's and making copies of the QAM and QAP's for training purposes.

QAP 19.1 Rev. 5

1. Added reference to an example log in 3.2.2 and added log as Attachment 1.
2. Removed CBI logo from sample nameplates in Attachment 2.

QAP 19.3 Rev. 0

1. New procedure for the repairs and alterations to tanks.

R. E. Shelton
Houston CQA

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SECTION 7 PURCHASER SUPPLIED PRODUCT

QAP 7.1	Rev. 5	Receipt of Customer Supplied Material When the Customer is Responsible for Verification of Material
* QAP 7.2	Rev. 3	Receipt of Customer Supplied Material When CBI is Responsible for Verification of Material

SECTION 8 PRODUCT IDENTIFICATION AND TRACEABILITY

* QAP 8.1	Rev. 5	Material Control, Identification and Traceability
+ QAP 8.2	Rev. 0	Unique Material Identification

SECTION 9 PROCESS CONTROL

QAP 9.1	Rev. 5	Process Control
* QAP 9.2	Rev. 8	Welding Control
QAP 9.3	Rev. 5	Heat Treating
QAP 9.4	Rev. 4	Control of Procedures

SECTION 10 INSPECTION AND TESTING

QAP 10.1	Rev. 7	Receiving Inspection
QAP 10.2	Rev. 6	NDE, Inspection and Testing
QAP 10.3	Rev. 5	Final Inspection
QAP 10.4	Rev. 4	Data Reports and Stamping for ASME Work

SECTION 11 INSPECTION, MEASURING AND TEST EQUIPMENT

QAP 11.1	Rev. 2	Calibration
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SECTION 12 INSPECTION AND TEST STATUS

QAP 12.1	Rev. 4	Inspection and Test Status
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SECTION 13 CONTROL OF NONCONFORMING PRODUCT

QAP 13.1	Rev. 6	Nonconformities
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INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

SECTION 14 CORRECTIVE ACTION

QAP 14.1 Rev. 4 Corrective Action

SECTION 15 HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY

QAP 15.1 Rev. 4 Handling, Storage, Packaging, Preservation and Delivery

SECTION 16 QUALITY RECORDS

QAP 16.1 Rev. 5 Quality Records
QAP 16.2 Rev. 2 Quality Records for ASME and NBIC Work

SECTION 17 INTERNAL QUALITY AUDITS

QAP 17.1 Rev. 6 Internal Auditing

SECTION 18 TRAINING

* QAP 18.1 Rev. 6 General Training and Qualification
QAP 18.2 Rev. 2 Qualification & Training Requirements of Personnel
QAP 18.3 Rev. 0 Qualification & Training Requirements For Engineering Personnel

SECTION 19 SERVICING

* QAP 19.1 Rev. 5 National Board Repairs and Alterations
QAP 19.2 Rev. 0 API-510 Repairs and Alterations
+ QAP 19.3 Rev. 0 Repairs, Alterations and Reconstruction of Tanks

SECTION 20 STATISTICAL TECHNIQUES

Robert E. Shelton
Houston CQA

Sept. 22, 1997
Date



DOC. ID QAP 4.1
 REV. NO. 7
 CONTRACT

TITLE PREPARATION OF DETAIL DRAWINGS,
 REQUISITIONS AND PROCUREMENT
 SPECIFICATIONS

PAGE NO. 1 OF 5

						BY	DATE
	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED JGS 8-19-92
	JH					CMD	REVISED RWK 7-30-97
APPROVED							AUTHORIZED <i>QMC</i> 9/15/97
							REFERENCED
							STANDARD --- REV. NO. -

1.0 SCOPE:

This procedure establishes the requirements for the preparation, review, approval, and release of detail drawings, requisitions and procurement specifications (except for welding materials).

2.0 RESPONSIBILITIES:

Engineering-Assigned is responsible for the preparation, review, approval and release of detail drawings, requisitions and procurement specifications.

3.0 DETAIL DRAWINGS:

3.1 Preparation

3.1.1 The Engineering Team Leader shall assign individuals to prepare detail drawings. Identification of the preparer shall be on the drawing.

3.1.2 Detail drawings shall include information based on design documents, customer documents, statutory and regulatory requirements, and the code in sufficient detail to fabricate or erect the item when used in conjunction with procedures.

3.1.3 The following information, as necessary, shall be included on the detail drawings:

- A. Description - item size and configuration
- B. Dimensional tolerances



TITLE	PREPARATION OF DETAIL DRAWINGS, REQUISITIONS AND PROCUREMENT SPECIFICATIONS	PAGE NO.	2	OF	5
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3.1.3 (cont'd)

C. Welding, heat treating, nondestructive examination and testing requirements

D. Material specification

3.2 Review and Approval

3.2.1 An individual assigned by the Engineering Team Leader, other than the preparer of the detail drawing, shall review and approve the detail drawing for conformance of details to the design documents, customer documents and code. The reviewer shall signoff on the detail drawing to indicate approval.

3.2.2 The Engineering Team Leader shall be responsible for assuring that the detail drawings have been reviewed for conformance with the design output.

3.3 Customer Approval

Engineering-Assigned shall coordinate any submittals to the customer or other involved parties for their approval when required.

4.0 REQUISITIONS:

4.1 Requisitions shall contain technical and quality assurance information needed for procurement. This information may be included on the requisition or included in a procurement specification.

4.2 Requisitions shall contain material management requirements sufficient to maintain traceability in accordance with CB&I Standard 607-2.

4.3 Advance Bill shall be based on the design documents, customer documents and code. These shall be handled in accordance with CB&I Standard 592-6 or 233-0-5.



DOC. ID QAP 4.1
REV. NO. 7
CONTRACT

TITLE PREPARATION OF DETAIL DRAWINGS,
REQUISITIONS AND PROCUREMENT
SPECIFICATIONS

PAGE NO. 3 OF 5

4.4 Final Bill of Material shall be based on the design documents, customer documents and code. These shall be handled in accordance with CB&I Standard 592-6 or 233-0-5.

4.5 Shipping Orders shall be based on the design documents, customer documents and code. Shipping Orders shall be handled in accordance with CB&I Standard 592-6-2 or 233-0-5.

5.0 PROCUREMENT SPECIFICATIONS:

5.1 Procurement specifications shall be based on the design documents, customer documents and code. The Engineering Team Leader shall assign an individual to prepare procurement specifications. Identification of the preparer shall be on the specification.

5.2 An individual assigned by the Engineering Team Leader, other than the preparer of the specification, shall review the specification for correctness and completeness and approve the specification for use. This approval shall be documented by a signoff on the specification.

6.0 ATTACHMENTS: (Typical)

6.1 Attachment 1 - Advance Bill

6.2 Attachment 2 - Final Bill of Material



DOC. ID QAP 4.1
 REV. NO. 7
 CONTRACT

TITLE PREPARATION OF DETAIL DRAWINGS,
 REQUISITIONS AND PROCUREMENT
 SPECIFICATIONS

PAGE NO. 4 OF 5

ATTACHMENT 1

ADVANCE BILL													
STRUCTURE										CERTIFICATION OF COMPLIANCE FOR PURCHASER		<input type="checkbox"/> NO	
MILL NO <input type="checkbox"/>										DESIGN SPECS		<input type="checkbox"/> YES ___ NO. OF COPIES	
INSPECTION YES <input type="checkbox"/> BY										CERTIFIED TEST REPORTS FOR PURCHASER		<input type="checkbox"/> NO	
										<input type="checkbox"/> YES ___ NO. OF COPIES			
SPECIAL INSTRUCTIONS													
LINE	MARK	PCS	DESCRIPTION	LENGTH		SPEC	ID	CODE	NO FAB	LN	PCS	ORDER OR RESERVE	SOURCE
				FT	IN.								
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
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17													
18													
19													
20													
21													
22													
23													
24													
PURCH ACTION		BY											
		CHKD											
		DATE											
DATE		LINE											
		PURCH ACTION											
		DATE											
ENG ASSIGNED			MADE BY	DATE	CHKD BY	DATE	MFG ASSIGNED	CONTRACT NO.	SHEET				

Printed in USA DE46E MAY 94 (FORMERLY DE 24 REV AUG 79)



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 REV. NO. 7
 CONTRACT

TITLE PREPARATION OF DETAIL DRAWINGS,
 REQUISITIONS AND PROCUREMENT
 SPECIFICATIONS

PAGE NO. 5 OF 5

ATTACHMENT 2

FINAL BILL OF MATERIAL																									
LN	SHIP NO	MARK	ASSM PC	DESCRIPTION	LENGTH		SPEC	ID NO PAB	CLAS&PT CODE	ESTD WT	LN PCS NO	ORDER OR RESERVE ROUTING	SOURCE	ENG ASSIGNED	MADE BY	DATE	CHKD BY	DATE	BY CHKD DATE	REVISION LINE	PURCH ACTION DATE	CONTRACT NO.	SHEET		
					FT	IN																			
01																									
02																									
03																									
04																									
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DOC. ID QAP 5.1
 REV. NO. 6
 CONTRACT

TITLE DOCUMENT AND DATA CONTROL

PAGE NO. 1 OF 7

						BY	DATE		
	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	JGS	8-19-92
	JH			LBR	AGR	CMD	REVISED	RWK	7-30-97
APPROVED				JCV			AUTHORIZED	<i>QMAC</i>	<i>9/15/97</i>
							REFERENCED		
							STANDARD	---	REV. NO. -

1.0 SCOPE:

1.1 This procedure lists the types of documents and data requiring control and describes how control is accomplished or where to find the control described.

1.2 The documents requiring control are:

- A. QAM and QAPs
- B. Contract Documents
- C. Contract Addenda and Contract QAPs
- D. Quality Plans
- E. Detail Drawings
- F. Requisitions and Procurement Specifications
- G. Procedures
- H. CBI Standards
- I. Design Output
- J. Customer Drawings (if used in lieu of CB&I detail drawings)
- K. Process Control Documents and Testing Instructions.

2.0 RESPONSIBILITIES:

The Corporate QA Manager, Engineering-Assigned, Contract Development Manager (CDM), Project Manager, Welding & QC Manager and CB&I Corporate Offices are responsible for controlling the above listed documents.

3.0 DOCUMENT FORMAT AND DISTRIBUTION CONTROL:

3.1 Documents shall be identified with a unique identification (ID) and, when applicable, the CB&I contract number.

3.2 The status of documents shall be controlled by the use of either a revision number (or letter) or by the use of an issue date.



- 3.3 Documents or data shall be distributed in one of the following formats:
- A. Hardcopy (paper) or electronic files (floppy disk, CD Rom, etc.)
 - B. E-mail
 - C. On-Line-Documentation (OLD)
- 3.4 Distributions of contract documents and data shall be controlled by a Master List (index or Summary "0" Sheet) that lists the documents and data by their identification and current revision status. The Master List shall be identifiable to a unique contract or project and have a revision status.
- 3.5 Design output that is used exclusively by Engineering-Assigned need not be controlled by a Master List, provided the calculations have a cover sheet that identifies its current revision status and is updated each time any page of the calculations is revised.
- 3.6 Documents and data made available as OLD are controlled by the provider and do not require a Master List or acknowledgment receipt control.
- 3.6.1 OLD controlled documents can be printed for the one time use by an individual, provided that the printed copy is destroyed upon completion of the task. If the printed copy is retained for the performance of any future tasks, the copy should be marked "uncontrolled copy" and prior to its next use the old version shall be checked to determine if a later revision has been issued.
 - 3.6.2 If a department establishes a manual of frequently used old controlled documents, the department shall generate a master list (index) of the old documents copied and control the manual's distribution and any revisions to the documents.



3.7 Forms depicted in the QAM and QAPs apply only to documents distributed by hardcopy. Documents distributed as electronic files, by e-mail and as OLD shall contain all the information required by the form; however, the information does not need to be presented as shown on the forms.

4.0 RECEIPT:

4.1 Upon the receipt of any controlled documents and data, the individual or organization receiving the documents or data shall check the identification and revision status against the Master List to assure they are correct.

4.2 For revisions, the obsolete documents shall be destroyed or marked "void" and kept separate from the current issue.

4.3 Further distribution shall be controlled by those individuals or organizations receiving the controlled documents and data.

5.0 ACKNOWLEDGMENT OF RECEIPT:

5.1 When acknowledgment of receipt is required, a letter of transmittal, Print Order and Transmittal (POT - see Attachment 1) or electronic return receipt requiring the recipient to acknowledge receipt of the documents shall be used.

5.2 The issuer of the documents or data shall assure an acknowledgment is received from each recipient. A follow-up copy of the acknowledgment shall be sent on a timely basis to those individuals or organizations who do not acknowledge receipt.

5.3 Acknowledgment of receipt is required:

5.3.1 For QAM and QAP distributions



5.3.2 For the following documents for ASME Section I, Section VIII & B31.1, NBIC and API-510 work (stamped and unstamped)

- A. Contract Addenda and Contract QAPs
- B. Quality Plans
- C. Detail Drawings
- D. Requisitions and Procurement Specifications
- E. Procedures
- F. Customer Drawings (when used in lieu of CB&I detail drawings)
- G. Process Control Documents and Testing Instructions

5.3.3 When specified by Customer, Code or CB&I Standard.

6.0 REVISIONS:

- 6.1 After the initial release of a document, changes may be made as required for the performance of the work.
- 6.2 Proposed changes shall be reviewed to ensure that the changes are in compliance with, as applicable, the design documents, customer documents, statutory and regulatory requirements, CB&I and Code requirements.
- 6.3 All changes shall be identified.
- 6.4 The revised document shall be reviewed, approved and distributed in the same manner as the original.

7.0 EMERGENCY CHANGES:

- 7.1 If an emergency change to a document is required, the originator shall authorize the change. This action shall be confirmed in writing by e-mail or fax with a copy to the Project Manager and Welding & QC Manager. The document shall be revised by the originator to reflect the change and distributed in the same manner as the original.



7.2 The emergency change authorization e-mail or fax shall be attached to the affected document and maintained until a revised document is received. When the revised document is received, the revision shall be reviewed to assure it complies with the requested change. If the revision does not properly address the requested change, the originator shall be contacted to resolve the issue.

8.0 PROCEDURE:

- 8.1 QAM and QAPs are distributed and controlled by the Corporate QA Manager. See QAP 2.1.
- 8.2 Contract Documents are distributed and controlled by the CDM and Project Manager. See QAP 3.2
- 8.3 Contract Addenda, Contract QAPs and Quality Plans are distributed and controlled by the Welding & QC Manager. See QAPs 2.1, 2.2 and 2.3.
- 8.4 Detail Drawings, Requisitions and Procurement Specifications are distributed and controlled by Engineering-Assigned. See QAP 5.2.
- 8.5 Procedures are distributed and controlled in accordance with QAP 5.4.
- 8.6 CB&I Standards are distributed and controlled in accordance with QAP 5.3.
- 8.7 Design Output is distributed and controlled in accordance with CB&I Standard 590-1-8.
- 8.8 Customer Drawings are distributed and controlled by the Project Manager. See QAP 5.5.
- 8.9 Process Control Documents and Testing Instructions are distributed and controlled in accordance with QAPs 9.1 and 10.2.



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REV. NO. 6
CONTRACT

TITLE DOCUMENT AND DATA CONTROL

PAGE NO. 6 OF 7

9.0 RECORDS:

The log used to record the returned acknowledgment receipts shall be retained until completion of the Contract or Project.

10.0 ATTACHMENTS (TYPICAL):

Attachment 1 - Print Order and Transmittal.



DOC. ID QAP 6.1
 REV. NO. 8
 CONTRACT

TITLE PROCUREMENT DOCUMENTS

PAGE NO. 1 OF 9

						BY	DATE	
	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	RGL 12-9-92
	JH			LBR	AGR	CMD	REVISED	RWK 7-30-97
APPROVED	DMM				JCV		AUTHORIZED	<i>RMC 9/15/97</i>
					DFP		REFERENCED	
STANDARD							---	REV. NO. -

1.0 SCOPE:

This procedure describes the preparation, distribution and control of Procurement Documents (Purchase Orders, Subcontracts and Contracts) including their related specifications.

2.0 RESPONSIBILITIES:

- 2.1 Purchasing is responsible for Procurement Documents and the purchase of goods and services.
- 2.2 The Project Manager is responsible for construction subcontracts.
- 2.3 Engineering-Assigned is responsible for preparing requisitions for material and items.
- 2.4 The Welding & QC Manager is responsible for preparing requisitions and procurement specifications for welding materials.
- 2.5 The group requesting the procurement of a service is responsible for preparing the requisition and any required procurement specifications for the required service.
- 2.6 The Component Supply Team (CST) is responsible for adding to requisitions the necessary scheduling, Purchasing assignment and delivery information required for procurement and making any required sourcing changes.



3.0 PROCUREMENT OF GOODS

- 3.1 Engineering-Assigned (or the Welding & QC Manager for welding material) prepares requisitions in accordance with QAP 4.1 and either transmits these to the CST for processing or notifies the CST of their on-line availability.
- 3.2 The CST reviews the requisitions, makes any required sourcing changes and adds the necessary additional information (i.e. delivery dates, ship to locations, etc.) to complete the requisitions. The CST may not add to, delete or alter any of the technical or quality assurance requirements of the requisition without approval of Engineering-Assigned and shall notify Engineering of any make/buy sourcing changes.
- 3.3 Engineering-Assigned shall review all make/buy sourcing changes and, if required, make any necessary changes to the requisition's technical and quality assurance requirements and generate any required procurement specifications.
- 3.4 The CST shall release completed requisitions so that they can be processed by Purchasing.
- 3.5 Purchasing shall review the released requisitions and all other applicable information (i.e. procurement specifications, drawings, instructions, etc.) for the material or item for completeness, select an approved supplier from the supplier database and prepare the appropriate Procurement Document. See Attachment 1 for an example of a Purchase Order.
- 3.5.1 Suppliers of material and items for ASME work that perform:
- a) welding, must hold an ASME Certificate of Authorization.
 - b) tack welding, must hold an ASME Certificate of Authorization unless ASME Section IX qualified weld procedures and welders are utilized.



3.5.1 (continued)

- c) welding of temporary lifting or alignment lugs, must hold an ASME Certificate of Authorization unless ASME Section IX qualified weld procedures and welders are utilized and the temporary welds are removed and the metal surface restored to a smooth contour.

For both (b) and (c) above, the Welding & QC Manager shall review and approve the weld procedures.

- d. cold forming of shell sections, heads or other pressure parts of carbon or low alloy steel plate, shall be required to provide written certification as to whether the material "has" or "has not" been heat treated.
- e. forming of heads, shall be required to provide written certification that the head complies with Code tolerance requirements (See PG-81, UG-81 or AF-135 as applicable).

3.6 Purchasing may not add to, delete or alter any of the requirements of the requisition or procurement specification without the written or electronic (FAX, e-mail, etc.) approval of the originator.

- 3.6.1 For minor changes to requirements that do not affect code and customer requirements or subsequent activities, a revision to the requisition or procurement specification is not required. In these cases a copy of the approval shall be included with the material or item's final records.



- 3.6.2 For changes that require a revision to the requisition or procurement specifications and procurement activities must proceed, a copy of the approval shall be attached to the affected document and maintained until a revised document is received. When the revised document is received, the revision shall be reviewed to assure it complies with the requested change. If the revision does not properly address the requested change, the originator shall be contacted to resolve the issue.
- 3.7 Procurement Documents shall contain the following information, as applicable:
- A. Document number and revision
 - B. Description of goods
 - C. Procurement Specification(s) and revision
 - D. Engineering drawings/sketches
 - E. Any special provisions or exclusions
 - F. Reference identification of material
 - G. Requirements for Test Certification
 - H. Source Inspection Requirements.
 - I. Requirements for intervention points (hold, witness, inspection, etc.)
 - J. Audit requirements
 - K. Requirements for resolution of nonconformance
 - L. Requirements for approval of supplier documents
 - M. Requirements for Code Certificate of Authorization and Data Reports for ASME work.
- 3.8 Prior to release, the Procurement Document shall be reviewed by Purchasing and approved for adequacy of specified requirements.
- 3.9 Distribution of Procurement Documents for goods shall be as follows:
- A. Supplier: Original, fax of original or Electronic Data Interchange (EDI) and acknowledgment copy* with all applicable procurement specifications.

*Acknowledgment copy as/when required by the Purchasing Manager



3.9 (continued)

- B. Receiving personnel: copy (or on-line access) with drawings/sketches (if required)
- C. Project Manager: as required
- D. Engineering-Assigned: as required
- E. Procurement files: copy (hardcopy or electronic)

3.10 Upon receipt of the Suppliers acceptance of the Procurement Document (signed original, acknowledgment copy, EDI, etc), Purchasing shall place it in the procurement file.

3.11 Upon receipt or notification from the Supplier of unacceptable items in the Procurement Document, Purchasing shall resolve them with the Supplier. If required, Purchasing shall get approval of the changes from the originator and the Customer. The final accepted Procurement Document shall be placed in the procurement file.

4.0 PROCUREMENT OF SERVICES:

4.1 Procurement of engineering services shall be in accordance with written instructions from the Engineering Manager.

4.2 Procurement of other services (calibration, machining, etc.) shall be as follows:

4.2.1 The group responsible for the work shall provide a requisition and procurement specifications, if required, to Purchasing outlining the scope of service.

4.2.2 Purchasing selects an approved supplier from the supplier database for providing the service and prepares the appropriate Procurement Document that includes all the information from the requisition.



- 4.2.3 Purchasing may not add to, delete, or alter any of the requirements of the requisition or procurement specifications without the written approval of the originator.
- 4.2.4 Procurement Documents for services shall contain the following information, as applicable:
- A. Document Number and Revision
 - B. Description of required services
 - C. Drawings/sketches
 - D. Procurement specification(s) and Revision
- 4.3 Prior to release, the Procurement Document shall be reviewed by Purchasing and approved for adequacy of specified requirements.
- 4.4 Distribution of the Procurement Document for services shall be as follows:
- A. Supplier: Original, fax of original or Electronic Data Interchange (EDI) with all applicable procurement specifications.
 - B. Responsible Group: as required
 - C. Procurement Files: copy (hardcopy or electronic)
- 4.5 Upon receipt of the Suppliers acceptance of the Procurement Document (signed original, acknowledgment copy, EDI, etc), Purchasing shall place it in the procurement file.
- 4.6 Upon receipt or notification from the Supplier of unacceptable items in the Procurement Document, Purchasing shall resolve them with the Supplier. If required, Purchasing shall get approval of the changes from the originator and the Customer. The final accepted Procurement Document shall be placed in the procurement file.



5.0 CONSTRUCTION SUBCONTRACTS:

- 5.1 The Project Manager, with the assistance of other Responsible Management, acquires the necessary technical information for the subcontract.
- 5.2 The Project Manager selects an approved supplier from the supplier database for providing the service and prepares the subcontract that includes all the necessary information in order for the Supplier to properly execute the subcontract.
- 5.3 Subcontracts shall contain the following information, as applicable:
- A. Subcontract number and Revision
 - B. Description of required work
 - C. Specifications and drawings/sketches
 - D. Requirements for intervention points (hold, witness inspection, etc.)
 - E. Requirements for approval of Supplier documents and procedures
 - F. Requirements for reports, certifications, documentation, etc.
 - G. Commercial terms and conditions
 - H. Safety program
- 5.4 Prior to release, the subcontract shall be reviewed by the Project Manager and approved for adequacy of specified requirements.
- 5.5 Distribution of the construction subcontract shall be as follows:
- A. Supplier: Original, fax of original or Electronic Data Interchange (EDI) with all applicable specifications.
 - B. Responsible Management: as required
 - C. Contract Files: copy (hardcopy or electronic)
- 5.6 Upon receipt of the Suppliers acceptance of the subcontract (signed original, EDI, etc), the Project Manager shall place it in the contract file.



5.7 Upon receipt or notification from the Supplier of unacceptable items in the subcontract, the Project Manager shall resolve them with the Supplier. If required, the Project Manager shall get approval of the changes from other Responsible Management and the Customer. The final accepted subcontract shall be placed in the contract file.

6.0 REVISIONS TO PROCUREMENT DOCUMENTS:

6.1 Revisions shall be processed in the same manner as the original.

6.2 Revisions shall be identified with a revision number.

7.0 CUSTOMER VERIFICATION OF PURCHASED PRODUCT:

The customer shall be given the right to verify at the source or upon receipt at a CB&I location that the purchased product complies with the specified requirements.

8.0 RECORDS:

Procurement Documents are contract records and shall be maintained by Purchasing or the Project Manager as required by CB&I Standards.

9.0 ATTACHMENTS: (Typical)

Attachment 1 - Purchase Order



DOC. ID QAP 6.1
 REV. NO. 8
 CONTRACT

TITLE PROCUREMENT DOCUMENTS

PAGE NO. 9 OF 9

ATTACHMENT 1

PURCHASE ORDER

CBI
 P.O. Box 41146
 Houston TX 77241-1146

Page -
 Ord. Date -
 Ord#/Stat -
 Brn/Plt -
 Cont. Ref. No.

SHIP TO CBI
 Building 5R - Yard
 8900 Fairbanks - N. Houston
 Houston TX 77064

Address Book No.

Freight -	Confirming
Delivery -	Terms - Net 45 (DEFAULT DO NOT DELET

Description	Qty Ordered	UM	Unit Cost	UM	Extension	Ship Dt	Tax
Ln# 1.000 Item No. - Contract Number: 37962108 COUPLING, A105, .5", 6000#, SCRD Weight. Material ID. C Cut With. Material Spec. A105	158-12 2.00	EA	102950 .0000	EA	Ext. Weight - .0000	04/17/97	LB Y
Ln# 2.000 Item No. - Contract Number: 37962108 PLUG, PIPE, A105, .5"DIA, SQ HD Weight. Material ID. C Cut With. Material Spec. A105	158-13 2.00	EA	102951 .0000	EA	Ext. Weight - .0000	04/17/97	LB Y
Ln# 3.000 Item No. - Contract Number: 37962108 FLANGE, A105, 18"DIA, 150#, RFSO Weight. Material ID. C Cut With. Material Spec. A105	188-2 1.00	EA	102956 .0000	EA	Ext. Weight - .0000	04/11/97	LB Y
Ln# 4.000 Item No. - Contract Number: 37962108 FLANGE, BLIND, A105, 18"DIA, RF Weight. Material ID. C	188-3 1.00	EA	102957 .0000	EA	Ext. Weight - .0000	04/11/97	LB Y

SAMPLE

Authorized By: _____
 CHUCK CARNES



DOC. ID QAP 7.2
 REV. NO. 3
 CONTRACT

TITLE RECEIPT OF CUSTOMER SUPPLIED MATERIAL
 WHEN CB&I IS RESPONSIBLE FOR VERIFICATION
 OF MATERIAL

PAGE NO. 1 OF 4

						BY	DATE	
	Engr	Corp	Corp	Const	Mfg	HSB	PREPARED	REK 10-10-95
	MJK	BGG	LBR	AGR	JCV	CMD	REVISED	RWK 7-30-97
APPROVED							AUTHORIZED	<i>RWK 9/15/97</i>
							REFERENCED	
							STANDARD	--- REV. NO. -

1.0 SCOPE:

This procedure covers the receipt, inspection and release of customer supplied material and items in the following conditions:

- 1.1 For ASME work, when CB&I is Code responsible for verifying that material and items are acceptable for their intended use. This will always be true for ASME work when CB&I assumes full Code responsibility for the vessel and signs the Manufacturer's Data Report.
- 1.2 For any work, when CB&I is contractually responsible for verifying that material and items are acceptable for their intended use.

2.0 RESPONSIBILITIES:

- 2.1 It is the customer's responsibility to ensure that all supplied material and items comply with CB&I detailed drawings, requisitions and procurement specifications and to supply CB&I with all specified documentation.
- 2.2 The Project Manager is responsible to ensure that the customer provides all specified documentation. Typical specified documentation:
 - 2.2.1 Copies of the material or item's original supplier's Material Test Report (MTR) or Certificate of Conformance (COC) based on the CB&I assigned material ID code.
 - 2.2.2 Copies of the Welding Procedure Specifications, Procedure Qualification Records, Welders Certifications and, if applicable, NDE reports (including film if radiographed) for welded parts and assemblies.



TITLE RECEIPT OF CUSTOMER SUPPLIED MATERIAL PAGE NO. 2 OF 4
WHEN CB&I IS RESPONSIBLE FOR VERIFICATION
OF MATERIAL

2.2.3 For ASME work:

- a) Certification of heat treatment for cold formed carbon steel or low alloy material pressure parts. See QAP 6.1.
- b) Certification of tolerances for formed heads. See QAP 6.1
- c) Partial Data Reports for welded parts.

2.3 The Welding & QC Manager in the shop or the Welding & QC Supervisor at the jobsite shall assure that the documentation supplied by the customer is complete.

2.4 Receiving personnel are responsible for receipt inspections.

2.5 Purchasing or other Responsible Management is responsible for releasing customer supplied material requiring a Receiving Inspection Report (RIR) for use and maintaining records relating to customer supplied items, such as ordering information, RIRs and supplier documentation.

3.0 PROCEDURE:

3.1 Customer supplied material shall be received in the same manner as material received from a supplier (See QAP 10.1) or as allowed in 3.2 below. Ordering information and documentation shall be supplied by the customer.

3.2 When customer supplied material that requires an RIR is received at a jobsite, the following may be used instead of paragraph 3.3 of QAP 10.1:

- A. The customer shall supply ordering information and documentation.



TITLE RECEIPT OF CUSTOMER SUPPLIED MATERIAL PAGE NO. 3 OF 4
WHEN CB&I IS RESPONSIBLE FOR VERIFICATION
OF MATERIAL

3.2 (continued)

- B. The Welding and QC Supervisor shall complete the upper portion of the "Metal Receiving Inspection Report" or the "Stores Receiving Inspection Report" (see CB&I Standard 607-3-3). When complete information is not available, notify the Project Manager.
- C. Receiving personnel shall:
1. Verify that all items received are listed on the shipping documents and properly identified.
 2. Inspect all items for any evidence of shipping damage.
 3. Inspect and document any special receiving requirements specified by CB&I or by customer documents accompanying the items.
 4. Document the inspection on an RIR. (see CB&I Standard 607-3-3).
 5. If the item is acceptable, the completed RIR and customer supplied documentation shall be forwarded to Purchasing or other Responsible Management and the item held pending final release.
 6. If the item is unacceptable, it shall be noted as nonconforming on the RIR and tagged or marked "hold" or placed in a designated hold area. The completed RIR and customer supplied documentation shall be forwarded to Purchasing or other Responsible Management for disposition



TITLE RECEIPT OF CUSTOMER SUPPLIED MATERIAL PAGE NO. 4 OF 4
WHEN CB&I IS RESPONSIBLE FOR VERIFICATION
OF MATERIAL

3.2 (continued)

D. Upon receiving the completed RIR and customer supplied documentation, Purchasing or other Responsible Management releases the items for use if the results of the receipt inspection and the check of the customer supplied documentation (Data Reports, MTRs or COCs (via hardcopy or electronic transfer), NDE reports, etc.) are acceptable.

3.3 Storage of customer supplied material shall be per QAP 15.1.

3.4 Nonconformities

Any nonconformities found including missing items, improper or incomplete documentation, incorrectly made or identified items and damaged items shall be reported to the customer for his disposition by the Project Manager via the RIR or a nonconformance report.

4.0 RECORDS:

The RIR, together with any associated documentation received with the material, are contract records and shall be maintained by Purchasing or other Responsible Management.



DOC. ID QAP 8.1
 REV. NO. 5
 CONTRACT

TITLE MATERIAL CONTROL, IDENTIFICATION AND TRACEABILITY

PAGE NO. 1 OF 5

						BY	DATE	
	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	RAJ 12-9-92
	JH	BGG		LBR	AGR	CMD	REVISED	RWK 7-30-97
APPROVED				JCV			AUTHORIZED	<i>RWK 9/15/97</i>
							REFERENCED	
							STANDARD	--- REV.NO. -

1.0 SCOPE:

This procedure describes the system used to control, identify and trace material, except welding material (see QAP 9.2).

2.0 DEFINITION:

Material Traceability Coding - The original supplier's identification (heat and slab, lot or coded marking), CB&I Unique Material Identification (UMID) or CB&I heat coding.

3.0 RESPONSIBILITIES:

- 3.1 Engineering-Assigned is responsible for determining material management requirements and including this information in requisitions.
- 3.2 The Component Supply Team (CST) is responsible for reviewing requisitions for the application of material and determining if material is to be supplied from stock or purchased.
- 3.3 Purchasing is responsible to purchase material as required from requisitions, the maintenance of material documentation and coordinating the verification or upgrading of stock material for use.
- 3.4 Shop QC may assume the responsibility for the maintenance of material documentation and coordinating the verification or upgrading of stock material for use at manufacturing facilities.
- 3.5 The Superintendent (Foreman) is responsible for applying material in accordance with detail drawings and requisitions and for marking and maintenance of material identification and traceability codings throughout use.



TITLE MATERIAL CONTROL, IDENTIFICATION AND TRACEABILITY

PAGE NO. 2 OF 5

4.0 PROCEDURE:

- 4.1 Engineering-Assigned determines material management requirements in accordance with CB&I Standard 607-2 and specifies the material management coding on requisitions.
- 4.2 The CST reviews requisitions and either applies material from stock or indicates it needs to be purchased. Material to be applied from stock shall be verified or upgraded per CB&I Standard 607-3-6 when required by the material management coding by completing a Verification of "Unassigned" Material report (VUM, see Attachment 1).
- 4.3 Purchasing purchases material from requisitions in accordance with QAP 6.1.
- 4.4 Material is released for use in accordance with QAP 7.1, QAP 7.2 or QAP 10.1.
- 4.5 The Superintendent (Foreman) applies material and items in accordance with detail drawings and requisitions and marks the CB&I identification on material and items in accordance with CB&I Standard 606-1-1. For any left-over material and items to be kept for other applications or for stock, the Superintendent (Foreman) shall mark the piece(s) with the original supplier's identification or CB&I UMID prior to placing it in storage.

NOTE: The Superintendent shall verify proper identification in cases where a supplier marks the CB&I identification on the material.

- 4.6 When material traceability is required by the material management coding, per CB&I Standard 607-3, the following applies:



TITLE MATERIAL CONTROL, IDENTIFICATION AND
TRACEABILITY

PAGE NO. 3 OF 5

4.6.1 The Superintendent (Foreman) shall maintain, transfer or mark, as applicable, the material traceability coding on the material or item per CB&I Standard 606-1-1 and complete a Daily Fabrication or Stores Release Report (DFR, see Attachment 2) in accordance with CB&I Standard 607-3-5. The completed form shall be sent to Purchasing.

NOTE: The Superintendent shall verify the material traceability coding in cases where a supplier marks the coding on the material.

4.6.2 The Superintendent (Foreman) shall record the material traceability coding on the applicable process control document. See QAP 9.1.

4.6.3 Purchasing, when required, shall verify material application against the requisition per CB&I Standard 607-3-1. If the check of the DFR discloses any discrepancies, it shall be investigated and resolved.

5.0 RECORDS:

All records generated per this procedure are contract records and shall be maintained by Purchasing.

6.0 ATTACHMENTS: (Typical)

6.1 Attachment 1 - Verification of Unassigned Material (VUM)


6.2 Attachment 2 - Daily Fabrication or Stores Release Report (DFR)



TITLE MATERIAL CONTROL, IDENTIFICATION AND TRACEABILITY

PAGE NO. 4 OF 5

ATTACHMENT 1



VERIFICATION OF "UNASSIGNED" MATERIAL

Request for Verification by: Shop Jobsite Purchasing

For use on contract _____ Engineering piece mark _____

Advance bill no. _____ Line no. _____ Final bill or shipping order no. _____
 Line no. _____

Material specification _____ Size needed _____

Source of material considered, check (✓) one

Stock _____

Leftover _____

Material from another contract _____

Thickness Record or Sketch

Stamping or marking of material considered

Contract no. _____

Ordered item no. _____

Material specification _____

Lot or heat and slab no. _____

Thickness or size _____

Mike readings required

Request made by _____ Date _____ ID of Measuring Instrument Used _____

Purchasing's Verification	Yes	No	Additional Operations Required To Bring Considered Material into conformity	Yes
Material specification agrees with billing.			Heat Treatment	✓
Material considered is identified.			Physicals	
Supplier's material certification has been located and checked.			Impacts	
Material has been verified as being proper for the application.			UT	
Additional operations required.			MT	
Material is approved for use.			PT	

Material Released for Fabrication

Purchasing _____ Date _____
 QC/QA _____ Date _____

Notes: If the material is used (other than welding materials), the Production Superintendent or storeroom must report it on a Daily Fabrication or Stores Release Report and purchasing will check what has been reported. A copy of the supplier's material certification must be filed under the contract on which it is used and an entry must be made on the Material Verification Summary Sheet.

File No.

Printed in USA See Standard 607-3-6 for instructions on using this form. OO 638 REV JAN 97




DOC. ID QAP 8.1
 REV. NO. 5
 CONTRACT

TITLE MATERIAL CONTROL, IDENTIFICATION AND TRACEABILITY

PAGE NO. 5 OF 5

ATTACHMENT 2



DAILY FABRICATION OR STORES RELEASE REPORT
METAL OR MISCELLANEOUS

See Standard 607-3-5 for instructions on using this form.

Contract No. _____ Recorder's ID _____
 Date _____
 Sheet No. _____

ROUTE TO	ROUTED BY	DATE	FOR ACTION	DONE BY	DATE

No. of Pieces	Engr'g Piece Mark	Heat Serial Code	Mill Markings		Material applied (use optional)					Notes	
			Heat/Lot/Control No.	Slab or Serial No.	Quan.	Item	Thick.	Spec.	CBI Order No.		
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

ORIGINAL TO PURCHASING
 COPY TO QA
 COPY RETAINED BY FOREMAN

File No.

Printed in USA OO 637 REV JAN 95



DOC. ID QAP 8.2
 REV. NO. 0
 CONTRACT

TITLE UNIQUE MATERIAL IDENTIFICATION

PAGE NO. 1 OF 5

						BY	DATE
	Engr	Corp Weld	Corp QA	Const	Mfg HSB	PREPARED	RWK 7-29-97
	JH	BGG		LBR	AGR CMD	REVISED	
APPROVED				JCV		AUTHORIZED	<i>CRW 9/15/97</i>
						REFERENCED	
						STANDARD	--- REV. NO. -

1.0 SCOPE:

This procedure describes the optional Unique Material Identification (UMID) System that can be used when material or items require traceability.

2.0 RESPONSIBILITIES:

- 2.1 The Manufacturing/Construction Manager is responsible for designating the department responsible for assigning UMIDs.
- 2.2 Purchasing is responsible for records relating to purchased materials and items including receiving inspection reports (RIRs).
- 2.3 Shop QC may assume Purchasing's responsibilities per this QAP at manufacturing facilities.
- 2.4 Receiving personnel are responsible for the marking of materials and items with the assigned UMID.
- 2.5 The designated department is responsible for assigning UMIDs.

3.0 PROCEDURE:

3.1 Material and items are received in accordance with QAP 10.1 and as modified as follows:

3.1.1 Purchasing shall initiate UMID-RIRs (see Attachments 1 & 2) and the UMID-Material Verification Summary Sheet (UMVSS - see Attachment 3) per CB&I Standard 607-3-9. Purchasing shall forward the RIRs to the designated department for the assigning of UMIDs.



3.1.2 The designated department shall assign a UMID, record it on each RIR and forward the RIRs to Receiving. A record shall be maintained of used UMIDs to prevent duplication.

3.1.3 Receiving personnel shall complete the normal receipt inspection process, mark the assigned UMID adjacent to the original supplier's identification markings and indicate on the RIR the material or item has been marked. The completed RIR shall be forwarded to Purchasing.

3.1.4 Purchasing shall complete the UMVSS.

4.0 RECORDS:

Records generated per this procedure are contract records and shall be maintained by Purchasing (or Shop QC).

5.0 ATTACHMENTS: (Typical)

5.1 Attachment 1 - UMID Metal Receiving Inspection Report

5.2 Attachment 2 - UMID Stores Receiving Inspection Report

5.3 Attachment 3 - UMID Material Verification Summary Sheet




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 REV. NO. 0
 CONTRACT

TITLE UNIQUE MATERIAL IDENTIFICATION

PAGE NO. 4 OF 5

Attachment 2



UMID STORES RECEIVING INSPECTION REPORT

Contract No. _____
 CB&I Order No. _____
 Item No. _____
 Supplier _____ Quan. Ordered _____
 Material Spec. _____
 Description _____
 Initiated By _____ Date _____

ROUTE TO	BY	DATE	FOR

Assigned UMID _____

RECEIVING INSPECTION: From Information on Material

Condition of Material _____
 Quantity Received and Inspected _____ Partial Complete
 Material Spec. (Marked on Material) _____
 Other Marking _____
 Supplier ID Marking _____

Dimensions Agree With Order,
 Sketch or Drawing Yes No

Nonconformities if "Yes", Explain (make Sketch if Necessary) Yes No

Material is held for Disposition Yes No Material marked with UMID Yes No

Reported By _____ Date _____ Ident. No. of Micrometer or Thickness Gage Used _____

<p>NONCONFORMITIES (For Material as Received) Description (By Purchasing) _____ _____ _____</p> <p>By CB&I Before Material Meets the Specification and Can Be Released For Use: Heat Treatment - Yes <input type="checkbox"/> MT - Yes <input type="checkbox"/> UT - Yes <input type="checkbox"/> PT - Yes <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/></p> <p>Other: _____ Processed By _____ Date _____</p> <p>Disposition (By QC) _____ _____ _____</p> <p>Approved By _____ Date _____ QC Disposition of Nonconformity Completed By _____ Date _____</p> <p><small>Printed in USA</small></p>	<p style="text-align: center;">MATERIAL RELEASED FOR FABRICATION</p> <p>Purchasing _____ Date _____</p> <p style="text-align: right;">FILE NO. <input style="width: 50px; height: 20px;" type="text"/></p> <p style="text-align: right;"><small>GO 604U JUL 97</small></p>
--	--

See Standard 607-3-9 for instructions on using this form



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 REV. NO. 8
 CONTRACT

TITLE WELDING CONTROL

PAGE NO. 1 OF 10

						BY	DATE	
	Corp	Corp				PREPARED	ALD 12-9-92	
Engr	Weld	QA	Const	Mfg	HSB	REVISED	RWK 8-6-97	
	BGG		LBR	AGR	CMD	AUTHORIZED	<i>BMC 9/15/97</i>	
APPROVED							REFERENCED	
						STANDARD	--- REV. NO. -	

1.0 SCOPE:

This procedure describes the system used to control welding, including tack welding, welding material, procedures and welders.

2.0 RESPONSIBILITIES:

2.1 The Welding & QC Manager coordinates controls relating to welding, preparation of welding procedure specifications (WPS), welding procedure qualifications (PQR), Welding Material Specifications (WMS) and Welding Material Test Specifications (WMT).

2.2 Purchasing is responsible for ordering welding materials.

2.3 The Welding & QC Supervisor controls the use of welding materials and the welding operations at the worksite.

2.4 The Superintendent (Foreman) is responsible for the assignment of welders.

3.0 WELDING MATERIALS:

3.1 Procurement Specifications

3.1.1 Procurement specifications for welding materials provide all technical and quality assurance requirements needed by the supplier.

3.1.2 Procurement specifications are not required for standard readily available materials which are described in SFA material specifications of the ASME Code. They are required when it is necessary to specify additional requirements.



3.1.3 The Welding and QC Manager shall assign an individual to prepare procurement specifications when none are available (WMSs for commonly used welding materials are provided in CB&I Standard 821-1). Identification of the preparer shall be on the specification.

3.1.4 Prior to release, the procurement specification shall be reviewed by the Welding & QC Manager for adequacy of specified requirements.

3.2 Requisitions

3.2.1 Requisitions are prepared by the Welding & QC Manager or by Engineering-Assigned and shall contain technical and quality assurance information needed for procurement. This information may be included on requisitions or included in procurement specifications.

3.2.2 For ASME work, all welding materials shall be purchased to the SFA Material Specifications of the ASME Code. See CB&I Standard 821-1.

3.3 Procurement

The procurement of welding materials shall be initiated by Purchasing in accordance with requisitions from Engineering-Assigned or the Welding & QC Manager.

3.4 Receiving Inspection

Welding materials shall be received, inspected and released in accordance with QAP 10.1, except that the releasing of welding materials requiring a WMS shall be per 3.5.

3.5 Release of Welding Materials Requiring a WMS.



3.5.1 In the shop, the Welding & QC Manager shall release the material for use if the results of the receipt inspection and the check of the Supplier's documentation (Material Test Report (MTR), Certificate of Conformance (COC), etc.) is acceptable. If the welding material is unacceptable, the Welding & QC Manager shall determine the disposition of the material.

3.5.2 In the field, the Welding & QC Supervisor shall release the material for use if the results of the receipt inspection and the check of the Supplier's documentation (Material Test Report (MTR), Certificate of Conformance (COC), etc.) is acceptable. If the welding material is unacceptable, the Welding & QC Manager shall be notified to determine the disposition of the material.

3.5.3 The release shall be documented on a copy of the Purchase Order, a receiving inspection report or a field receiving inspection report for welding materials (see attachment 2).

3.6 Storage of Welding Materials

Storage of welding materials shall be in accordance with CB&I Standard 823 or specific instructions for the contract. As a minimum:

- A. Storage shall be in a clean, dry atmosphere free from effects due to weather.
- B. Welding material shall be organized by type and size.
- C. The welding material storage area shall be secured if necessary to prohibit access by unauthorized personnel.
- D. Nonconforming or non-released welding material shall be segregated if practical and/or clearly marked to indicate that it cannot be issued for use.



3.7 Control of Welding Materials

3.7.1 Selection of the correct welding materials shall be determined by the Superintendent (Foreman) or Welding & QC Supervisor in accordance with contract drawings, welding procedures, process control documents, Bill Sheets and other specific contract instructions.

3.7.2 Welding materials shall be drawn for use under the direction of the Welding & QC Supervisor.

3.7.3 Welding & QC Supervisors shall maintain surveillance over welding operations to ensure usage of the proper welding materials.

4.0 WELDER AND WELDING OPERATOR QUALIFICATIONS:

4.1 Instructions for welder qualifications (includes welding operator) are given in CB&I Standard 839-1. For ASME work, all welders and welding operators shall be qualified to ASME Section IX.

4.2 All welder and welding operator qualifications are controlled by the Welding & QC Manager with the following requirements:

- A. Each welder and welding operator shall be qualified for applicable contract requirements including referenced codes or specifications.
- B. Welder and welding operator tests shall be conducted using a qualified Welding Procedure Specification (WPS).
- C. When required by the contract, welder and welding operator tests shall be witnessed by the customer or AI.
- D. Each welder and welding operator shall be assigned a unique identifying number or symbol.
- E. Welder and welding operator performance qualifications shall be documented on Performance Qualification Test forms and any other form required by the contract. (See Attachment 1 for a typical example.)



4.3 Maintenance of Welder and Welding Operator Qualifications

4.3.1 Qualifications shall be maintained by the Welding & QC Manager in accordance with applicable Code and standards. Maintenance of qualifications shall be updated at least every six (6) months.

4.3.2 Copies of qualifications shall be maintained at jobsites until completion of the work.

5.0 WELDING PROCEDURE SPECIFICATIONS (WPS):

5.1 Instructions for the preparation and writing of WPS's are given in CB&I Standard 830-1. For ASME work, all WPS's shall be qualified to ASME Section IX.

5.1.1 Requirements for WPS's shall be determined after contract review to determine technical requirements for welding procedures.

5.1.2 WPS's shall be standard procedures or prepared for each contract in accordance with contract requirements including referenced Codes or specifications.

5.1.3 Each WPS shall have substantiating Procedure Qualification Records (PQR) to demonstrate the satisfactory performance of the WPS. Depending upon contract requirements, PQR's may be previously qualified or performed new for the specific contract.

5.2 Procedure Qualifications Records (PQR)

5.2.1 Instructions for the preparation and writing of PQR's is given in CB&I Standard 831-1.

5.2.2 PQR's shall include, as a minimum, the following:

- A. Base materials and welding materials.
- B. Records of all essential and nonessential variables.
- C. Results of mechanical and chemical testing.



5.2.2 (con't)

- D. Results of nondestructive examination.
- E. Certification of PQR by a CB&I Welding Engineer.

5.2.3 When required by the contract, preparation, welding, inspection and testing shall be witnessed by the customer or AI.

6.0 CONTROL OF WELDING:

6.1 Assignment of Welders

The assignment of work to welders is the responsibility of the Superintendent (Foreman) who shall consult with the Welding & QC Supervisor to determine that the welders are qualified to perform the work. Welding & QC Supervisors are responsible for advising the Superintendent (Foreman) when a welder is not qualified or lacks training and experience to the degree that sufficient supervision cannot be given to ensure proper results.

6.2 Welding Activities

6.2.1 The Welding & QC Supervisor shall review the WPS and instruct the welder in its use. This instruction may be verbal and/or by demonstration.

6.2.2 Welding & QC Supervisors shall monitor welding for compliance with the WPS and perform inspections required by process control documents.

6.2.3 Documentation of welding verifications and inspections shall be made on process control documents when required.

6.3 Welder Identification for ASME Work:



6.3.1 Welders shall mark their identifying number or symbol on or adjacent to and at intervals of not more than 3 ft. along the welds they make or a record shall be kept of the welders used on each joint. Marking shall be with steel stencils, using low stress dies, unless the material is less than 1/4" in thickness (1/2" for nonferrous materials), in which case paint or ink markers shall be used.

NOTE: These are the category A, B, C, D joints per paragraph UW-3, of ASME Section VIII, Division 1; per paragraph AD-400, of ASME Section VIII, Division 2; per paragraph PW-28, of ASME Section I; and per ASME B31.1.

6.3.2 All welders that have welded permanent nonpressure attachment welds on a vessel and/or tack welds that become part of the final pressure weld shall be listed on an "Assembly Check List" or "Process Control Drawing".

6.4 Tack welds used to secure alignment shall either be removed completely when they have served their purpose, or their stopping and starting ends shall be properly prepared by grinding or other suitable means so that they may be satisfactorily incorporated into the final weld and shall be visually inspected by the Welding & QC Supervisor.

7.0 RECORDS:

7.1 WPS's and PQR's are contract records and shall be maintained by the Welding & QC Manager.

7.2 Records required by this procedure, other than WPS's and PQR's, are internal records and shall be maintained by the Welding & QC Manager.



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REV. NO. 8
CONTRACT

TITLE WELDING CONTROL

PAGE NO. 8 OF 10


8.0 ATTACHMENTS: (Typical)

8.1 Attachment 1 - Performance Qualification Test Form

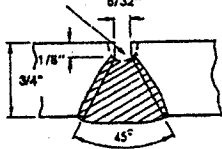
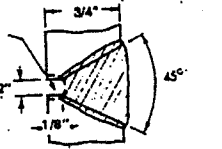
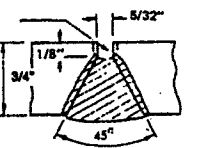
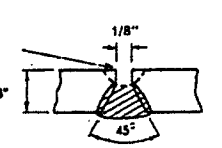
8.2 Attachment 2 - Field Receiving Inspection Report for
Welding Material



ATTACHMENT 1



PERFORMANCE QUALIFICATION TEST
 In Accordance with Section IX of the ASME Code - Latest Edition
SHIELDED METAL ARC PROCESS

Material - Spec: _____ to _____ of P No. _____ to P No. _____		Record of Utilization	
Weld Procedure Specification Number (WPS): _____		Month / Year	Type of Insp.
Filler Metal (F No.) F: _____		Initials	
Filler Metal (SFA) Specification SFA: _____			
Back gouge to clean metal and weld overhead 	This test qualifies all thickness ranges to be welded. OVERHEAD - BOTH SIDES	Test Method 2 Bends per QW-462 Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Radiography of 6" of test plate Result <input type="checkbox"/>
Back gouge to clean metal and weld horizontal 	This test qualifies all thickness ranges to be welded. HORIZONTAL - BOTH SIDES	Test Method 2 Bends per QW-462 Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Radiography of 6" of test plate Result <input type="checkbox"/>
Back gouge to clean metal and weld vertical 	All passes uphill except first pass and wash passes which may be run downhill or uphill. This test qualifies all thickness ranges to be welded. VERTICAL - BOTH SIDES	Test Method 2 Bends per QW-462 Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Radiography of 6" of test plate Result <input type="checkbox"/>
Back gouge to clean metal and weld vertical 	All passes are to be run downhill. This test qualifies range 0" to 3/4" 3/8" SINGLE BEVEL BUTT VERTICAL	Test Method 2 Bends per QW-462 Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Radiography of 6" of test plate Result <input type="checkbox"/>
1. Qualification on butt welds also qualifies welder for fillet welds and butt welds with back-up bars 2. Qualification with F-0 & F-4X electrodes may be made on P-1 test plates. 3. Radiography of a 6" section of plate may be used in lieu of bend test. 4. Qualification with F-4 electrode also qualifies for F-3, F-2, and F-1. 5. Acceptance of test results includes the examination of welded coupon(s) for complete penetration and fusion.			
Date	Location	Social Security No.	Birth Date
			Started CBI Year:
WE CERTIFY THAT THE STATEMENTS MADE IN THIS RECORD ARE CORRECT AND THAT THE TEST WELDS WERE PREPARED, WELDED, AND TESTED IN ACCORDANCE WITH SECTION IX OF THE ASME CODE - LATEST EDITION / AND MAINTAINED FROM THE TIME OF TEST TO THIS DATE.		Address:	Specimen Mark:
		City:	Year:
		State:	
Full Name:		X = X-Ray	
CBI REPRESENTATIVE		V = Visual	
DATE	First	Middle	R = Renewal
	Last		

WL 111 (FRONT) REV AUG 93




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TITLE WELDING CONTROL

PAGE NO. 10 OF 10

ATTACHMENT 2



**FIELD RECEIVING INSPECTION REPORT
FOR WELDING MATERIALS**

Contract Number _____ CBI Order Number _____

Supplier _____ Manufacturer _____

RECEIVING INSPECTION

Quantity Received and Inspected _____

Size and Type _____

Specification _____

Condition of Material _____

Nonconformity: Yes No

 If yes explain: _____

Explain Disposition: _____

Material Meets Requirements of:

Bill Sheet Purchase Order Requisition

Release for Fabrication: _____ Date _____

(Welding & QC Supervisor)

WL 247 REV DEC 89



TITLE GENERAL TRAINING AND QUALIFICATION

PAGE NO. 1 OF 3

	Engr	Corp Weld	Corp QA	Const	Mfg	BY	DATE
APPROVED			RES			RGL	8-19-92
			JCJ			RWK	7-28-97
						<i>RMC</i>	<i>9/15/97</i>
						---	REV.NO. -

1.0 SCOPE:

This procedure contains the general training and qualification requirements of personnel that affect quality.

2.0 RESPONSIBILITIES:

2.1 The Corporate QA Manager is responsible for the training of top management and for approving any specific organizational training and qualification procedure.

2.2 Managers are responsible for the training, qualification and, if required, certification of individuals in their organization.

3.0 TOP MANAGEMENT TRAINING AND QUALIFICATION:

3.1 Training of top management in the quality system will be on an as needed basis. The necessary familiarization, understanding and training takes place as top management participate in the overall management of the quality system. This will be supplemented by specific training as necessary coincident with the annual management review process.

3.2 For the purposes of this procedure, top management includes:

- A. Presidents
- B. Vice-Presidents
- C. Corporate Managers
- D. General Managers



3.2 (cont'd)

E. Manufacturing Managers

F. Construction Managers

3.3 Top management has overall responsibility for all activities. Activities as described in this quality system, except for management review, are delegated to other trained, qualified and, if required, certified individuals.

3.4 Top management is qualified based on their broad experience and background in the business of CB&I as contained in proprietary company records. These individuals are selected for their positions by the Board of Directors or other top management.

4.0 ORGANIZATIONAL TRAINING AND QUALIFICATION PROCEDURE:

Managers shall train and qualify individuals in their organization per QAP 18.2 or write a specific organizational training procedure for their organization. Specific organizational procedures shall be submitted to the Corporate QA Manager for approval and added to the QAP index.

5.0 TRAINING GUIDELINES:

5.1 The training methods utilized and the extent of the initial indoctrination and training in the Quality Assurance Manual (QAM) and Quality Assurance Procedures (QAPs) shall be based on the education, experience and proficiency of the individual. It is the Manager's responsibility to make this determination.

5.2 Training in revisions after the initial indoctrination may be by the individual's review of a summary of changes or reading assignments.



DOC. ID QAP 18.1
REV. NO. 6
CONTRACT

TITLE GENERAL TRAINING AND QUALIFICATION

PAGE NO. 3 OF 3

5.3 Controlled documents that are copied for training assignments, shall be destroyed after the completion of training or marked "training copy". Training materials shall not be used to perform contract work.

6.0 RECORDS:

No records are required by this procedure.



DOC. ID QAP 19.1
 REV. NO. 5
 CONTRACT

TITLE NATIONAL BOARD REPAIRS AND ALTERATIONS PAGE NO. 1 OF 9

Engr	Corp Weld	Corp QA	Const	Mfg	HSB CMD		BY	DATE
						APPROVED	PREPARED	RES
	REVISED	RWK	9-10-97					
	AUTHORIZED	RWK	7/22/97					
	REFERENCED							
	STANDARD	---	REV. NO. -					

1.0 SCOPE:

This procedure covers the special requirements for repairs and alterations to pressure retaining items which are performed in accordance with the National Board Inspection Code (NBIC). Repairs and alterations are defined in the NBIC. All such repairs or alterations performed by CB&I will be done in accordance with this procedure, the QAM and the jurisdictional requirements at the final location.

This QAP contains additions to or modifications of the requirements of the QAM. Except as modified here, all other requirements of the QAM are applicable to repairs and alterations, to the extent required by contractual scope of work. CB&I Standard 934 contains additional instructions for NBIC work.

2.0 SPECIAL CONSIDERATIONS:

2.1 Prior to the start of work, the scope of repairs and alterations shall be presented to the AI for his concurrence.

2.2 In the case of routine repairs, determine whether routine repairs are acceptable to the jurisdiction where the work is to be performed, in addition to the AI's concurrence. The requirement for in-process involvement of the AI and stamping are waived for routine repairs. Routine repairs shall be documented with NBIC Form R-1 "Report of Welded Repair" and shall include a statement on line 9, Remarks: "Routine Repair".

2.3 For ASME Section VIII Division 2, NBIC requires a repair plan certified by a Registered Professional Engineer which has to be accepted by the AI. This shall be prepared by the user or CB&I.



2.4 NBIC Nameplates (Also see CB&I Standard 9201-5-3)

Applying a "repair", "altered" or "rerated" nameplate or applying the contract number and date repaired to an existing CB&I R symbol stamp "repair" nameplate signifies that the work was performed in compliance with the requirements of the NBIC.

2.4.1 "Repair" nameplates are used with NBIC Form R-1. A single nameplate may be used for more than one repair, so a new nameplate is not always required. If the product already has a CB&I R symbol stamp "repair" nameplate, the new contract number and date repaired are added to the existing nameplate.

2.4.2 "Alteration" nameplates are used with NBIC Form R-2. All alterations require a new nameplate.

2.4.3 "Rerated" nameplates are also used with NBIC Form R-2. All reratings require a new nameplate.

2.4.4 Subject to the acceptance of the AI, nameplates and stamping may not be required for routine repairs.

2.5 CB&I is responsible for all Code required activities in the scope of the repair or alteration even if some activities are performed by others. The only exception to this is when design certification for an alteration is provided on a Form R-2 "Report of Alteration" by another valid "R" Certificate Holder. In such a case, the organization performing the design must provide a Form R-2 certifying the design. This will be attached to CB&I's Form R-2.

2.6 For material or welded assemblies supplied by others, QAM requirements apply except as modified below:



2.6.1 Documentation (COC's, MTR's or Code Data Reports) shall be supplied to CB&I for:

- A. Plate Material.
- B. Welded assemblies.
- C. Product forms ordered to a CB&I Material Specification or a material supplementary requirement

For all other product forms, the material may be accepted as complying with the ASME material specification if the ASME material specification provides for the marking of each piece, bundle, lift, or shipping container with the specification designation, including the grade, type, and class, if applicable, and each piece, bundle, lift, or shipping container is so marked.

2.6.2 Documentation shall be reviewed for Code compliance and traceability to the material, product or welded assembly by the Welding & QC Manager or Purchasing, as determined by the Welding & QC Manager.

2.7 Pressure Test

2.7.1 Upon completion of repairs to pressure retaining items, the repairs shall be pressure tested except as provided in paragraph 2.8.4.

2.7.2 Upon completion of alterations that involve the installation of a replacement part and/or the alteration will impact the design pressure, the design temperature or the design rated capacity, the item shall be pressure tested except as provided in paragraph 2.8.4.

2.7.3 Pressure tests may be pneumatic provided concurrence has been received from the AI, the jurisdiction, where required, and the owner.



2.7.4 As an alternate to the pressure test, NDE methods may be substituted provided concurrence has been received from the AI and the jurisdiction, where required.

3.0 RESPONSIBILITIES:

3.1 Engineering-Assigned:

- 3.1.1 Prepares requisitions for nameplates and drafts of Form R-1 or R-2 and distributes them via a POT to the Schedule Coordinator or Welding & QC Manager.
- 3.1.2 Requests application of a stamp by transmitting a draft of Form R-1 or R-2 via a POT to the designated Welding & QC Manager (NBIC Certificate Holder) with a copy to the Construction Welding & QC Manager, if applicable.
- 3.1.3 Duties when the vessel is rerated and controlled by Engineering-Assigned:
 - 3.1.3.1 Controls any pre-stamped nameplate and assures the application of the proper nameplate to the appropriate product.
 - 3.1.3.2 Applies the pre-stamped nameplate after determining that concurrence of the AI has been received (as shown by the AI's signature on the Form R-2).
 - 3.1.3.3 Sends a copy of the completed Form R-2, to the designated Welding & QC Manager.
- 3.1.4 Prepares and checks National Board Form R-1 or R-2. The form shall clearly state the exact scope of CB&I's responsibility, and shall be distributed as indicated below. Engineering-Assigned may delegate preparation of Form R-1 or R-2 to the Project Manager or Welding & QC Manager. If delegated, the preparer shall send the Form R-1 or R-2 to Engineering-Assigned for approval. Engineering-Assigned will contact the designated Welding & QC Manager for the next



3.1.4 (continued)

sequential Form R number, when applicable, and include it on the form in the appropriate locations. As an alternate, either Engineering-Assigned, or the Welding & QC Manager may insert the sequential Form R number once it has been assigned by the designated Welding & QC Manager. Engineering-Assigned shall transmit the original form via POT to the Project Manager with a copy to the designated Welding & QC Manager. The Project Manager will present the original to the AI.

Any Manufacturer's Partial Data Report or National Board Form R-3 "Report of Parts Fabricated by Welding" required for welded components shall be attached and made a part of the Form.

3.1.5 Makes the necessary distribution of completed forms.

Legible copies shall be distributed as follows:

- A. Owner or User
- B. AI
- C. Jurisdiction (if required)
- D. Authorized Inspection Agency (AIA) responsible for In-Service Inspection
- E. NBIC (if registered) within 90 days of completion

3.2 Designated Welding & QC Manager (NBIC Certificate Holder):

- 3.2.1 Maintains custody of the R symbol stamp.
- 3.2.2 Maintains the log of sequential "Form R" numbers. See Attachment 1 for an example of the sequential log.
- 3.2.3 Applies the R symbol stamp to the nameplate. This may be delegated to the Construction Welding & QC Manager, if applicable.
- 3.2.4 Reviews requests for nameplates after receipt of information from Engineering-Assigned.



- 3.2.5 Assigns the next sequential Form R number.
- 3.2.6 If applicable, supplies any necessary stamps to the Construction Welding & QC Manager and assures that they are returned after field application.
- 3.2.7 Assures, if applicable, the proper application of nameplates by reviewing a copy of the completed Form R-1 or R-2 and maintains a written record of this activity.

3.3 Welding & QC Manager:

- 3.3.1 Notifies Engineering-Assigned as to the scope of work and when a stamp/nameplate needs to be at a jobsite.
- 3.3.2 Controls pre-stamped nameplates and assures the application of the proper nameplate to the appropriate product.
- 3.3.3 Applies the prestamped nameplate or applies contract number and date repaired to an existing CB&I R symbol stamp "repair" nameplate after determining that concurrence of the AI has been received (as shown by the AI's signature on the Form R-1 or R-2).
- 3.3.4 Applies the stamp, if required, to the product nameplate in accordance with 2.4 and, if applicable, returns the stamp to the designated Welding & QC Manager.
- 3.3.5 If applicable, sends a copy of the completed Form R-1 or R-2 to the designated Welding & QC Manager.

4.0 RECORDS:

- 4.1 Records generated per this procedure are contract records and shall be maintained by Engineering-Assigned.
- 4.2 The sequential Form R number log is a record and shall be maintained by the designated Welding & QC Manager.



DOC. ID QAP 19.1
REV. NO. 5
CONTRACT

TITLE NATIONAL BOARD REPAIRS AND ALTERATIONS PAGE NO. 7 OF 9

5.0 ATTACHMENTS

- 5.1 Attachment 1 - Typical "Form R" Sequential Log.
- 5.2 Attachment 2 - Typical samples of nameplates.



ATTACHMENT 2

REPAIRED BY					
<div style="border: 1px solid black; height: 150px; width: 100%;"></div> <p style="font-size: small; margin-top: 5px;">National Board Symbol and Certificate No.</p>	* See Note 1				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; height: 20px;"></td> <td style="width: 40%; height: 20px;"></td> </tr> <tr> <td style="font-size: x-small; text-align: center;">CB&I Contract No.</td> <td style="font-size: x-small; text-align: center;">Date Repaired</td> </tr> </table>			CB&I Contract No.	Date Repaired
	CB&I Contract No.	Date Repaired			
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CB&I Contract No.	Date Repaired				

ALTERED BY					
<div style="border: 1px solid black; height: 120px; width: 100%;"></div> <p style="font-size: small; margin-top: 5px;">National Board Symbol and Certificate No.</p>	* See Note 1				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center; font-size: x-small;">PSI AT</td> <td style="width: 40%; text-align: center; font-size: x-small;">*F</td> </tr> <tr> <td style="text-align: center; font-size: x-small;">(MAWP)</td> <td style="text-align: center; font-size: x-small;">(TEMP)</td> </tr> </table>	PSI AT	*F	(MAWP)	(TEMP)
	PSI AT	*F			
(MAWP)	(TEMP)				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; height: 20px;"></td> <td style="width: 40%; height: 20px;"></td> </tr> <tr> <td style="font-size: x-small; text-align: center;">CB&I Contract No.</td> <td style="font-size: x-small; text-align: center;">Date Altered</td> </tr> </table>			CB&I Contract No.	Date Altered	
CB&I Contract No.	Date Altered				

RERATED BY					
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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center; font-size: x-small;">PSI AT</td> <td style="width: 40%; text-align: center; font-size: x-small;">*F</td> </tr> <tr> <td style="text-align: center; font-size: x-small;">(MAWP)</td> <td style="text-align: center; font-size: x-small;">(TEMP)</td> </tr> </table>	PSI AT	*F	(MAWP)	(TEMP)
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(MAWP)	(TEMP)				
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CB&I Contract No.	Date Altered				

*NOTE 1 Enter Company Name



DOC. ID QAP 19.3
 REV. NO. 0
 CONTRACT

TITLE REPAIRS, ALTERATIONS AND RECONSTRUCTION
 OF TANKS

PAGE NO. 1 OF 2

					BY	DATE
	Corp	Corp				
Engr	Weld	QA	Const	Mfg	PREPARED	RWK 9-4-97
JML	BGG		LBR	AGR	REVISED	
APPROVED					AUTHORIZED	<i>QMC 9/22/97</i>
					REFERENCED	
					STANDARD	REV. NO.

1.0 SCOPE:

This procedure covers the special requirements for repairs, alterations and reconstruction of tanks. All such work performed by CB&I shall be done in accordance with this procedure, the QAM, applicable codes and local statutory/regulatory requirements.

This QAP contains additions to or modifications of the requirements of the QAM. Except as modified here, all other requirements of the QAM are applicable to repairs, alterations and reconstruction to the extent required by contractual scope of work.

2.0 SPECIAL CONSIDERATIONS:

2.1 Prior to accepting a contract to repair, alter or reconstruct a tank, Engineering-Assigned shall review the request.

2.2 In instances where the customer does not wish to follow codes and/or prevailing regulations, CB&I shall inform the customer of the lack of compliance in the proposal or other written correspondence. Engineering-Assigned shall approve such work prior to proceeding and appropriate clarifications of limits of responsibility shall be placed in the contract agreement.

3.0 PROCEDURE:

3.1 The Project Manager shall review the scope of work with Engineering-Assigned, the Welding & QC Manager, Purchasing and any other Responsible Management to determine the need for their involvement in the work.



TITLE REPAIRS, ALTERATIONS AND RECONSTRUCTION PAGE NO. 2 OF 2
OF TANKS

3.2 When the scope or type of work warrants it, the Project Manager, or other assigned individual, may assume, with the concurrence of the Responsible Party, some or all of the duties specified in the QAM if they are qualified. It is the Project Manager's responsibility, in these cases, to assure that all applicable manual and CB&I requirements are being complied with.

4.0 REPAIRS AND ALTERATIONS TO TANKS BUILT TO API 650 (and its predecessor 12C):

- 4.1 Engineering Oversight shall approve all cases where the customer does not wish to follow API 653 requirements.
- 4.2 Only certified API 653 Authorized Inspectors shall perform external inspections of tanks except for routine in-service inspections as permitted by API 653.
- 4.3 CB&I Standard 933 contains additional instructions for API-653 work



Return to: Chicago Bridge & Iron
P. O. Box 41146
Houston, TX 77241-1146
Attn: R. E. Shelton
Houston CQA

December 3, 1997

DOCUMENT TRANSMITTAL

**Quality Assurance Procedures (QAP's)
for ANSI/ASQC Standard Q9001 (ISO 9000)**

**TO: Larry K. Jones
California Institute of Technology
Controlled Copy Number - 201**

FROM: R. E. Shelton - Houston CQA

Attached is the "Index for CB&I Quality Assurance Procedures", Revision 16 dated 11/13/97 along with the changed QAP's as listed on the index.

Only pages 1 and 2 are enclosed for QAP 5.1 and QAP 10.1. Make sure that you do not throw away the remaining pages.

Also attached is the "QAP Changes for Index Revision 16" which summarizes the changes.

Acknowledge receipt of these documents by signing below and returning one copy of this transmittal to R. E. Shelton (Houston CQA) by Jan. 5, 1998. If you wish, you may respond by E-Mail. When using E-Mail, please be sure to refer to the copy number(s) you received.

If you have any questions, call Robert Shelton or Ron Kruzic.



SIGNATURE

12/30/97

DATE

cc: RWK/JCJ/1113-2-1 (Distribution)
F/U: 1/5/98



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DATE

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F/U: 1/5/98

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 16

The following QAP's have been revised or minor changed. A documented review of this summary sheet for the revised QAP's by the applicable individuals may be used for their indoctrination/training to these QAP's. A documented review is not required for minor changes.

QAP 5.1 Rev. 6

Minor change to 3.6.1 and 3.6.2 by correcting the lower case "old" to upper case "OLD".

QAP 5.5 Rev. 5

Added 3.2.1 "For ASME work, Engineering-Assigned shall review all customer drawings."

QAP 10.1 Rev. 7

Minor change to 1.0 correcting the pagination of paragraph.

QAP 10.4 Rev. 5

Replaced typical samples of nameplates on page 4.

QAP 19.3 Rev. 1

Deleted 4.2 and renumbered 4.3 to 4.2.

INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

+ Addition
- Deletion
* Revision
∅ Documentation
¢ Index Correction

SECTION 1 MANAGEMENT RESPONSIBILITY

QAP 1.1 Rev. 7 Management Responsibility
QAP 1.2 Rev. 2 Authorized Inspectors (AI)

SECTION 2 QUALITY SYSTEM

QAP 2.1 Rev. 4 Quality System
QAP 2.2 Rev. 4 Quality Plan
QAP 2.3 Rev. 4 Contract QAPs
QAP 2.4 Rev. 0 Work Instructions

SECTION 3 CONTRACT REVIEW

QAP 3.1 Rev. 5 Pre-Contract Review (Opportunity Development)
QAP 3.2 Rev. 5 Post-Award Review

SECTION 4 DESIGN CONTROL

QAP 4.1 Rev. 7 Preparation of Detail Drawings, Requisitions
and Procurement Specifications
QAP 4.2 Rev. 3 Additional Design Requirements for ASME Work

SECTION 5 DOCUMENT CONTROL

∅ QAP 5.1 Rev. 6 Document and Data Control
QAP 5.2 Rev. 5 Detail Drawings, Requisitions and
Procurement Specifications
QAP 5.3 Rev. 2 CB&I Standards
QAP 5.4 Rev. 6 Contract QA Documents
* QAP 5.5 Rev. 5 Customer Drawings
QAP 5.6 Rev. 2 Control of Documents Made Available
Electronically On-Line

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INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

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QAP 6.1	Rev. 8	Procurement Documents
QAP 6.2	Rev. 4	Supplier Survey
QAP 6.3	Rev. 5	Supplier Review
QAP 6.4	Rev. 2	Supplier Control

SECTION 7 PURCHASER SUPPLIED PRODUCT

QAP 7.1	Rev. 5	Receipt of Customer Supplied Material When the Customer is Responsible for Verification of Material
QAP 7.2	Rev. 3	Receipt of Customer Supplied Material When CBI is Responsible for Verification of Material

SECTION 8 PRODUCT IDENTIFICATION AND TRACEABILITY

QAP 8.1	Rev. 5	Material Control, Identification and Traceability
QAP 8.2	Rev. 0	Unique Material Identification

SECTION 9 PROCESS CONTROL

QAP 9.1	Rev. 5	Process Control
QAP 9.2	Rev. 8	Welding Control
QAP 9.3	Rev. 5	Heat Treating
QAP 9.4	Rev. 4	Control of Procedures

SECTION 10 INSPECTION AND TESTING

Ø QAP 10.1	Rev. 7	Receiving Inspection
QAP 10.2	Rev. 6	NDE, Inspection and Testing
QAP 10.3	Rev. 5	Final Inspection
* QAP 10.4	Rev. 5	Data Reports and Stamping for ASME Work

SECTION 11 INSPECTION, MEASURING AND TEST EQUIPMENT

QAP 11.1	Rev. 2	Calibration
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SECTION 12 INSPECTION AND TEST STATUS

QAP 12.1	Rev. 4	Inspection and Test Status
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SECTION 13 CONTROL OF NONCONFORMING PRODUCT

QAP 13.1	Rev. 6	Nonconformities
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INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

SECTION 14 CORRECTIVE ACTION

QAP 14.1 Rev. 4 Corrective Action

SECTION 15 HANDLING, STORAGE, PACKAGING, PRESERVATION AND
DELIVERY

QAP 15.1 Rev. 4 Handling, Storage, Packaging, Preservation
and Delivery

SECTION 16 QUALITY RECORDS

QAP 16.1 Rev. 5 Quality Records
QAP 16.2 Rev. 2 Quality Records for ASME and NBIC Work

SECTION 17 INTERNAL QUALITY AUDITS

QAP 17.1 Rev. 6 Internal Auditing

SECTION 18 TRAINING

QAP 18.1 Rev. 6 General Training and Qualification
QAP 18.2 Rev. 2 Qualification & Training Requirements of
Personnel
QAP 18.3 Rev. 0 Qualification & Training Requirements For
Engineering Personnel

SECTION 19 SERVICING

QAP 19.1 Rev. 5 National Board Repairs and Alterations
QAP 19.2 Rev. 0 API-510 Repairs and Alterations
* QAP 19.3 Rev. 1 Repairs, Alterations and Reconstruction of
Tanks

SECTION 20 STATISTICAL TECHNIQUES

R.E. Shelton

Houston CQA

11-13-97

Date



DOC. ID QAP 5.1
 REV. NO. 6
 CONTRACT

TITLE DOCUMENT AND DATA CONTROL

PAGE NO. 1 OF 7

						BY	DATE	
	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	JGS 8-19-92
	JH			LBR	AGR	CMD	REVISED	RWK 7-30-97
APPROVED					JCV		AUTHORIZED	<i>QMAC</i> 9/15/97
							REFERENCED	
							STANDARD	--- REV. NO. -

1.0 SCOPE:

1.1 This procedure lists the types of documents and data requiring control and describes how control is accomplished or where to find the control described.

1.2 The documents requiring control are:

- A. QAM and QAPs
- B. Contract Documents
- C. Contract Addenda and Contract QAPs
- D. Quality Plans
- E. Detail Drawings
- F. Requisitions and Procurement Specifications
- G. Procedures
- H. CBI Standards
- I. Design Output
- J. Customer Drawings (if used in lieu of CB&I detail drawings)
- K. Process Control Documents and Testing Instructions.

2.0 RESPONSIBILITIES:

The Corporate QA Manager, Engineering-Assigned, Contract Development Manager (CDM), Project Manager, Welding & QC Manager and CB&I Corporate Offices are responsible for controlling the above listed documents.

3.0 DOCUMENT FORMAT AND DISTRIBUTION CONTROL:

3.1 Documents shall be identified with a unique identification (ID) and, when applicable, the CB&I contract number.

3.2 The status of documents shall be controlled by the use of either a revision number (or letter) or by the use of an issue date.



3.3 Documents or data shall be distributed in one of the following formats:

- A. Hardcopy (paper) or electronic files (floppy disk, CD Rom, etc.)
- B. E-mail
- C. On-Line-Documentation (OLD)

3.4 Distributions of contract documents and data shall be controlled by a Master List (index or Summary "0" Sheet) that lists the documents and data by their identification and current revision status. The Master List shall be identifiable to a unique contract or project and have a revision status.

3.5 Design output that is used exclusively by Engineering-Assigned need not be controlled by a Master List, provided the calculations have a cover sheet that identifies its current revision status and is updated each time any page of the calculations is revised.

3.6 Documents and data made available as OLD are controlled by the provider and do not require a Master List or acknowledgment receipt control.

3.6.1 OLD controlled documents can be printed for the one time use by an individual, provided that the printed copy is destroyed upon completion of the task. If the printed copy is retained for the performance of any future tasks, the copy should be marked "uncontrolled copy" and prior to its next use the OLD version shall be checked to determine if a later revision has been issued.

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3.6.2 If a department establishes a manual of frequently used OLD controlled documents, the department shall generate a master list (index) of the OLD documents copied and control the manual's distribution and any revisions to the documents.



DOC. ID QAP 5.5
 REV. NO. 5
 CONTRACT

TITLE CUSTOMER DRAWINGS

PAGE NO. 1 OF 2

						BY	DATE	
APPROVED	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	RGL 8-19-92
				LBR	AGR	CMD	REVISED	RWK 10-8-97
				MLR			AUTHORIZED	<i>SPW/K 11/13/97</i>
				JDM			REFERENCED	
							STANDARD	--- REV. NO. -

1.0 SCOPE:

This procedure establishes the requirements for use of customer drawings in lieu of CB&I detail drawings when required by the contract. "Customer Drawings" includes any documents supplied by the customer to be used by CB&I to accomplish the work.

2.0 RESPONSIBILITIES:

The Project Manager is responsible for control and distribution of customer drawings.

3.0 CONTROL OF CUSTOMER DRAWINGS

3.1 The Project Manager shall obtain the customer drawings and acknowledge receipt if requested. He shall advise the customer of shortages, discrepancies or inadequacies (e.g., missing drawings or dimensions - not whether an item is adequate for intended use unless required by contract). Only customer drawings that have been approved for use by the customer shall be distributed within CB&I. Revisions shall be reviewed by the Project Manager to determine the impact on any work already accomplished. Appropriate individuals or organizations shall be notified if necessary.

3.2 The Project Manager shall review the scope of work with Engineering-Assigned to determine the need for engineering review of the customer drawings.

3.2.1 For ASME work, Engineering-Assigned shall review all customer drawings.



TITLE CUSTOMER DRAWINGS

PAGE NO. 2 OF 2

- 3.3 The Project Manager shall establish an internal distribution. Engineering-Assigned shall be included on the distribution if required for review. The Project Manager shall retain copies of all current customer drawings.
- 3.4 The Project Manager shall initiate an index of approved customer drawings with current revision levels if the customer does not supply an index.
- 3.5 The customer drawings together with the index of approved drawings shall be distributed by the Project Manager. A transmittal document and receipt acknowledgement may be required depending on the number of sets, the method transmitted and where the customer documents are transmitted. Appropriate control shall be determined by the Project Manager. When receipt acknowledgement is established, follow-up on overdue responses shall be documented.
- 3.6 Recipients of customer drawings shall properly file and update the customer drawings and sign and return receipt acknowledgement when required.
- 3.7 The Project Manager shall require that obsolete drawings are removed from use.

4.0 RECORDS:

- 4.1 Customer drawings and the approved drawing index are contract records and shall be maintained by the Project Manager as required by contract, Code, jurisdiction and CB&I Standards.
- 4.2 When transmittal documents are required they shall be maintained until the end of the contract.



DOC. ID QAP 10.1
 REV. NO. 7
 CONTRACT

TITLE RECEIVING INSPECTION

PAGE NO. 1 OF 10

	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	BY	DATE
				LBR	AGR	CMD	PREPARED	ALD 12-9-92
			BGG		EJS		REVISED	RWK 1-6-97
APPROVED					JCV		AUTHORIZED	<i>RWK 6/24/97</i>
							REFERENCED	
							STANDARD	--- REV. NO. -

Extensively Revised

1.0 SCOPE:

QC
10-29-97

This procedure describes the receipt, inspection and release of items (excluding welding materials, per QAP 9.2, and Customer supplied material, per QAPs 7.1 and 7.2) from a supplier or CB&I shop.

2.0 RESPONSIBILITIES:

- 2.1 Purchasing is responsible for records relating to purchased items including receiving inspection reports (RIRs), supplier documentation and releasing items for use that require an RIR or a preliminary release.
- 2.2 Shop QC may assume Purchasing's responsibilities per this QAP at manufacturing facilities.
- 2.3 Receiving personnel are responsible for receipt inspections and releasing items that do not require an RIR.
- 2.4 The Welding & QC Manager is responsible for resolving nonconformities and for releasing items that require a nonconforming release.

3.0 PROCEDURE:

3.1 Receipt

3.1.1 When required by Code, customer or CB&I Standard to assure that items received are properly identified and documented, Purchasing (or Shop QC) shall initiate RIRs (see Attachment 1) and Material Verification Summary Sheets (MVSSs) (see Attachment 2). See CB&I Standard 607-3.



- 3.1.2 When items are received from a supplier or CB&I shop, Receiving personnel shall obtain any documentation supplied with the items.
- 3.1.3 Receiving personnel shall perform receipt inspections immediately upon receipt of an item(s) or shall segregate the item(s) until a receipt inspection can be performed.
- 3.1.4 For items from a supplier, Receiving personnel shall check to see that they have the required information for the items from Purchasing (or Shop QC). This includes the RIR (see CB&I Standard 607-3-3) when required, and the Purchase Order (PO), hardcopy or electronic access, including any sketches or drawings.
- 3.1.5 For items from a CB&I shop, Receiving personnel shall check to see that they have the shop packing lists and, if required, the Shop Release for Shipment Check List (SRSCl) (Attachment 3). The SRSCl is used to document:
- A. final inspection of items before shipment
 - B. the items have been manufactured and documented per the applicable Code, CB&I and QAM requirements
 - C. AI's concurrence, for ASME work, that the items have been inspected and meet Code requirements
 - D. purchaser acceptance, if required, by contract
 - E. receiving inspection at the receiving shop or field

Manufacturing-Assigned initiates the SRSCl and the receiving location completes the form. See CB&I Standards 607-3 and 607-3-8.



DOC. ID QAP 10.4
 REV. NO. 5
 CONTRACT

TITLE DATA REPORTS AND STAMPING FOR ASME WORK PAGE NO. 1 OF 4

						BY	DATE	
	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	REK 10-10-95
	JH	BGG	RWK	LBR	AGR	CMD	REVISED	RWK 10-6-97
APPROVED							AUTHORIZED	<i>RMIC 11/13/97</i>
							REFERENCED	
							STANDARD	--- REV. NO. -

1.0 SCOPE:

This procedure specifies the requirements for Code Data Reports and stamping for ASME work.

2.0 RESPONSIBILITIES:

2.1 Engineering-Assigned is responsible for the preparation and distribution of Data Reports, specifying stamping requirements and the registration, when required, of items with the National Board.

2.2 The Welding & QC Manager is responsible for signing the Data Report on behalf of CB&I, controlling Code symbol stamps and prestamped nameplates and the stamping (or applying the stamped nameplate) of completed ASME work.

3.0 DEFINITIONS:

Issue date - The date that all reviews are complete and the Data Report is ready to be issued.

4.0 DATA REPORTS:

4.1 Using the appropriate ASME Codebook section and forms for the item being stamped, Engineering-Assigned prepares the Data Report.

See CB&I Standard 4000-4-1 for additional instructions for ASME Section VIII Data Reports.

4.2 Engineering-Assigned shall transmit the Data Report via a Print Order Transmittal (POT), see QAP 5.1, to the Shop Schedule Coordinator or Project Manager.

4.3 The Welding & QC Manager shall sign the Data Report on the behalf of CB&I after:



- 4.3.1 Confirming that the work has been completed in accordance with the detail drawings as listed on the Data Report. These final detail drawings become the "as-built" drawings for the work.
- 4.3.2 Confirming that all process control documents have been completed and all nonconformances and audit findings have been resolved.
- 4.4 The CB&I signed Data Report and any other required documentation shall then be presented to the AI for certification.
 - 4.4.1 The signature of the AI on the Manufacturer's Data Report, indicates the AI's satisfaction that all Code requirements have been met in the shop or field and is the AI's authorization to apply the Code symbol.
 - 4.4.2 For shipments from a CB&I shop to a CB&I jobsite, the signature of the AI on the "Shop Release For Shipment Check List" indicates to the AI in the field or receiving shop that material test reports, the system for transfer of identification for unwelded Code materials, and the fabrication and welding of Code material have been reviewed and accepted as being in accordance with the Code and this manual. These forms for each shipment shall be made available to the AI at the receiving location.
 - 4.4.3 Manufacturer's Partial Data Reports (when applicable) and "Shop Release for Shipment Check List" shall be forwarded to the receiver.
- 4.5 The Welding & QC Manager shall forward the signed completed Data Report to Engineering-Assigned for final distribution.

5.0 STAMPING:

- 5.1 Code symbol stamps are controlled by the designated Welding & QC Manager (ASME/NBIC certificate holder).
- 5.2 For ASME work, when a stamped nameplate is to be applied, Engineering-Assigned shall prepare a detailed



drawing of the nameplate and requisition for it's preparation. The nameplate shall be similar in layout and required information to the samples shown in paragraph 8.0. See CB&I Standard 9201-5-3 for additional instructions for ASME Section VIII nameplates.

- 5.3 For ASME work, when the stamp is to be applied directly to the item (no nameplate), Engineering-Assigned shall prepare a detailed drawing of the required information to be stamped and the location(s) of the stamping.
- 5.4 The Welding & QA Manager shall control the stamp or pre-stamped nameplate and shall assure that the stamp (or nameplate) is applied to the appropriate item after the AI has signed the corresponding Data Report.

6.0 NATIONAL BOARD REGISTRATION OF NEW WORK:

- 6.1 See CB&I Standard 4000-4-1 for National Board Registration requirements and control of National Board numbers.
- 6.2 Engineering-Assigned shall submit an original and one legible copy of the Manufacturer's Data Report, within 90 days of certification, to the National Board of Boiler and Pressure Vessel Inspectors. All vessels shall be registered unless specifically prohibited by the purchaser. If prohibited by the purchaser for Section VIII, Division 2 Products, Engineering-Assigned shall maintain a copy of the Manufacturer's Data Report per QAP 16.2.
- 6.3 For repairs and alterations to Pressure Retaining Items which are performed in accordance with the National Board Inspection Code, see QAP 19.1.

7.0 RECORDS:

Data Reports are quality records and shall be maintained per QAP 16.1 and QAP 16.2.

8.0 ATTACHMENTS:

Typical Samples of Nameplates



NAT'L. BD.
 National Board Serial No.

CERTIFIED BY

* See Note 1

Code Stamp

PSIG AT * F
 Maximum Allowable Working Pressure

* F AT PSIG
 Minimum Design Metal Temperature

MPWE No. Year Built

CBI Contract No. Vessel No.

Capacity (Or Max Diameter And Overall Length)

**HORTON®
 PRESSURE VESSEL**

NAT'L. BD.
 National Board Serial No.

CERTIFIED BY

* See Note 1

Code Stamp

PSIG AT * F
 Maximum Allowable Working Pressure

* F AT PSIG
 Minimum Design Metal Temperature

MPWE No. Year Built

CBI Contract No. Vessel No.

Capacity (Or Max Diameter And Overall Length)

HORTONSPHERE®

NAT'L. BD.
 NATIONAL BOARD SERIAL NO.

Certified By

* See Note 1

CODE STAMP

MANUFACTURER'S SERIAL NO.

MAXIMUM ALLOWABLE WORKING PRESSURE

HEATING SURFACE OR KILOWATTS

YEAR BUILT RATED STEAMING CAPACITY CBI CONTRACT NO.

* NOTE 1: Enter Company Name



DOC. ID QAP 19.3
 REV. NO. 1
 CONTRACT

TITLE REPAIRS, ALTERATIONS AND RECONSTRUCTION OF TANKS PAGE NO. 1 OF 2

	Engr	Corp Weld	Corp QA	Const	Mfg		BY	DATE
						PREPARED	RWK	9-4-97
						REVISED	RES	10-21-97
APPROVED	JML	BGG		LBR	AGR	AUTHORIZED	<i>RWK 11/13/97</i>	
						REFERENCED		
						STANDARD		REV. NO.

1.0 SCOPE:

This procedure covers the special requirements for repairs, alterations and reconstruction of tanks. All such work performed by CB&I shall be done in accordance with this procedure, the QAM, applicable codes and local statutory/regulatory requirements.

This QAP contains additions to or modifications of the requirements of the QAM. Except as modified here, all other requirements of the QAM are applicable to repairs, alterations and reconstruction to the extent required by contractual scope of work.

2.0 SPECIAL CONSIDERATIONS:

2.1 Prior to accepting a contract to repair, alter or reconstruct a tank, Engineering-Assigned shall review the request.

2.2 In instances where the customer does not wish to follow codes and/or prevailing regulations, CB&I shall inform the customer of the lack of compliance in the proposal or other written correspondence. Engineering-Assigned shall approve such work prior to proceeding and appropriate clarifications of limits of responsibility shall be placed in the contract agreement.

3.0 PROCEDURE:

3.1 The Project Manager shall review the scope of work with Engineering-Assigned, the Welding & QC Manager, Purchasing and any other Responsible Management to determine the need for their involvement in the work.



DOC. ID QAP 19.3
REV. NO. 1
CONTRACT

TITLE	REPAIRS, ALTERATIONS AND RECONSTRUCTION OF TANKS	PAGE NO.	2	OF	2
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3.2 When the scope or type of work warrants it, the Project Manager, or other assigned individual, may assume, with the concurrence of the Responsible Party, some or all of the duties specified in the QAM if they are qualified. It is the Project Manager's responsibility, in these cases, to assure that all applicable manual and CB&I requirements are being complied with.

4.0 REPAIRS AND ALTERATIONS TO TANKS BUILT TO API 650 (and its predecessor 12C):

4.1 Engineering Oversight shall approve all cases where the customer does not wish to follow API 653 requirements.

4.2 CB&I Standard 933 contains additional instructions for API-653 work



Return to: Chicago Bridge & Iron
P. O. Box 41146
Houston, TX 77241-1146
Attn: R. E. Shelton
Houston CQA

March 18, 1998

DOCUMENT TRANSMITTAL

**Quality Assurance Procedures (QAP's)
for ANSI/ASQC Standard Q9001 (ISO 9000)**

**TO: Larry K. Jones
California Institute of Technology
Controlled Copy Number - 201**

FROM: R. E. Shelton - Houston CQA

Attached is the "Index for CB&I Quality Assurance Procedures", Revision 17 dated March 16, 1998 along with the changed QAP's as listed on the index.

Also attached is the "QAP Changes for Index Revision 17" which summarizes the changes.

Acknowledge receipt of these documents by signing below and returning one copy of this transmittal to R. E. Shelton (Houston CQA) by April 17, 1998. If you wish, you may respond by E-Mail. When using E-Mail, please be sure to refer to the copy number(s) you received.

If you have any questions, call Robert Shelton (713-896-3729) or Ron Kruzic (713-896-5917).

SIGNATURE

4/20/98
DATE

cc: RWK/JCJ/1113-2-1 (Distribution)
F/U: 4-17-98

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 17

The following QAP's have been revised. Except for those QAP's that are new or extensively revised, a documented review of this summary sheet for the revised QAP's by the applicable individuals may be used for their indoctrination/training to these QAP's.

QAP 9.2 Rev. 9

1. Revised "Welder Identification" in 6.3.
2. Added new 6.4 concerning using welders that are not employed by CB&I.

QAP 10.1 Rev. 8

This procedure has been extensively revised.

QAP 10.5 Rev. 5

New procedure for "Receiving Inspection Requirements for Items from a CB&I Shop".

QAP 15.1 Rev. 5

This procedure has been extensively revised.

QAP 16.2 Rev. 3

This procedure has been extensively revised.

QAP 18.2 Rev. 3

Added QAP 10.5 to training matrix in Attachment 1

INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

SECTION 6 PURCHASING

QAP 6.1	Rev. 8	Procurement Documents
QAP 6.2	Rev. 4	Supplier Survey
QAP 6.3	Rev. 5	Supplier Review
QAP 6.4	Rev. 2	Supplier Control

SECTION 7 PURCHASER SUPPLIED PRODUCT

QAP 7.1	Rev. 5	Receipt of Customer Supplied Material When the Customer is Responsible for Verification of Material
QAP 7.2	Rev. 3	Receipt of Customer Supplied Material When CBI is Responsible for Verification of Material

SECTION 8 PRODUCT IDENTIFICATION AND TRACEABILITY

QAP 8.1	Rev. 5	Material Control, Identification and Traceability
QAP 8.2	Rev. 0	Unique Material Identification

SECTION 9 PROCESS CONTROL

QAP 9.1	Rev. 5	Process Control
* QAP 9.2	Rev. 9	Welding Control
QAP 9.3	Rev. 5	Heat Treating
QAP 9.4	Rev. 4	Control of Procedures

SECTION 10 INSPECTION AND TESTING

* QAP 10.1	Rev. 8	Receiving Inspection Requirements for Items from a Supplier
QAP 10.2	Rev. 6	NDE, Inspection and Testing
QAP 10.3	Rev. 5	Final Inspection
QAP 10.4	Rev. 5	Data Reports and Stamping for ASME Work
+ QAP 10.5	Rev. 0	Receiving Inspection Requirements for Items from a CB&I Shop

SECTION 11 INSPECTION, MEASURING AND TEST EQUIPMENT

QAP 11.1	Rev. 2	Calibration
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SECTION 12 INSPECTION AND TEST STATUS

QAP 12.1	Rev. 4	Inspection and Test Status
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SECTION 13 CONTROL OF NONCONFORMING PRODUCT

QAP 13.1	Rev. 6	Nonconformities
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QUALITY ASSURANCE PROCEDURES

SECTION 14 CORRECTIVE ACTION

QAP 14.1 Rev. 4 Corrective Action

SECTION 15 HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY

* QAP 15.1 Rev. 5 Handling, Storage, Packaging, Preservation and Delivery

SECTION 16 QUALITY RECORDS

QAP 16.1 Rev. 5 Quality Records
* QAP 16.2 Rev. 3 Quality Records for ASME and NBIC Work

SECTION 17 INTERNAL QUALITY AUDITS

QAP 17.1 Rev. 6 Internal Auditing

SECTION 18 TRAINING

QAP 18.1 Rev. 6 General Training and Qualification
* QAP 18.2 Rev. 3 Training and Qualification Requirements of Personnel
QAP 18.3 Rev. 0 Qualification & Training Requirements For Engineering Personnel

SECTION 19 SERVICING

QAP 19.1 Rev. 5 National Board Repairs and Alterations
QAP 19.2 Rev. 0 API-510 Repairs and Alterations
QAP 19.3 Rev. 1 Repairs, Alterations and Reconstruction of Tanks

SECTION 20 STATISTICAL TECHNIQUES

R. E. Shelton

Houston CQA

March 16, 1998

Date



DOC. ID QAP 9.2
 REV. NO. 9
 CONTRACT

TITLE WELDING CONTROL

PAGE NO. 1 OF 10

		Corp	Corp				BY	DATE
Engr	Weld	QA	Const	Mfg	HSB			
APPROVED			LBR	AGR	CMD	PREPARED	ALD	12-9-92
			JDM			REVISED	RWK	1-20-98
			DAD			AUTHORIZED	<i>RWK</i>	<i>3/3/98</i>
						REFERENCED		
						STANDARD	---	REV. NO. -

1.0 SCOPE:

This procedure describes the system used to control welding, including tack welding, welding material, procedures and welders.

2.0 RESPONSIBILITIES:

2.1 The Welding & QC Manager coordinates controls relating to welding, preparation of welding procedure specifications (WPS), welding procedure qualifications (PQR), Welding Material Specifications (WMS) and Welding Material Test Specifications (WMT).

2.2 Purchasing is responsible for ordering welding materials.

2.3 The Welding & QC Supervisor controls the use of welding materials and the welding operations at the worksite.

2.4 The Superintendent (Foreman) is responsible for the assignment of welders.

3.0 WELDING MATERIALS:

3.1 Procurement Specifications

3.1.1 Procurement specifications for welding materials provide all technical and quality assurance requirements needed by the supplier.

3.1.2 Procurement specifications are not required for standard readily available materials which are described in SFA material specifications of the ASME Code. They are required when it is necessary to specify additional requirements.



3.1.3 The Welding and QC Manager shall assign an individual to prepare procurement specifications when none are available (WMSs for commonly used welding materials are provided in CB&I Standard 821-1). Identification of the preparer shall be on the specification.

3.1.4 Prior to release, the procurement specification shall be reviewed by the Welding & QC Manager for adequacy of specified requirements.

3.2 Requisitions

3.2.1 Requisitions are prepared by the Welding & QC Manager or by Engineering-Assigned and shall contain technical and quality assurance information needed for procurement. This information may be included on requisitions or included in procurement specifications.

3.2.2 For ASME work, all welding materials shall be purchased to the SFA Material Specifications of the ASME Code. See CB&I Standard 821-1.

3.3 Procurement

The procurement of welding materials shall be initiated by Purchasing in accordance with requisitions from Engineering-Assigned or the Welding & QC Manager.

3.4 Receiving Inspection

Welding materials shall be received, inspected and released in accordance with QAP 10.1, except that the releasing of welding materials requiring a WMS shall be per 3.5.

3.5 Release of Welding Materials Requiring a WMS.



- 3.5.1 In the shop, the Welding & QC Manager shall release the material for use if the results of the receipt inspection and the check of the Supplier's documentation (Material Test Report (MTR), Certificate of Conformance (COC), etc.) is acceptable. If the welding material is unacceptable, the Welding & QC Manager shall determine the disposition of the material.
- 3.5.2 In the field, the Welding & QC Supervisor shall release the material for use if the results of the receipt inspection and the check of the Supplier's documentation (Material Test Report (MTR), Certificate of Conformance (COC), etc.) is acceptable. If the welding material is unacceptable, the Welding & QC Manager shall be notified to determine the disposition of the material.
- 3.5.3 The release shall be documented on a copy of the Purchase Order, a receiving inspection report or a Field Receiving Inspection Report for Welding Materials (see attachment 2).
- 3.6 Storage of Welding Materials
- Storage of welding materials shall be in accordance with CB&I Standard 823 or specific instructions for the contract. As a minimum:
- A. Storage shall be in a clean, dry atmosphere free from effects due to weather.
 - B. Welding material shall be organized by type and size.
 - C. The welding material storage area shall be secured if necessary to prohibit access by unauthorized personnel.
 - D. Nonconforming or non-released welding material shall be segregated if practical and/or clearly marked to indicate that it cannot be issued for use.



3.7 Control of Welding Materials

- 3.7.1 Selection of the correct welding materials shall be determined by the Superintendent (Foreman) or Welding & QC Supervisor in accordance with contract drawings, welding procedures, process control documents, Bill Sheets and other specific contract instructions.
- 3.7.2 Welding materials shall be drawn for use under the direction of the Welding & QC Supervisor.
- 3.7.3 Welding & QC Supervisors shall maintain surveillance over welding operations to ensure usage of the proper welding materials.

4.0 WELDER AND WELDING OPERATOR QUALIFICATIONS:

- 4.1 Instructions for welder qualifications (includes welding operator) are given in CB&I Standard 839-1. For ASME work, all welders and welding operators shall be qualified to ASME Section IX.
- 4.2 All welder and welding operator qualifications are controlled by the Welding & QC Manager with the following requirements:
 - A. Each welder and welding operator shall be qualified for applicable contract requirements including referenced codes or specifications.
 - B. Welder and welding operator tests shall be conducted using a qualified Welding Procedure Specification (WPS).
 - C. When required by the contract, welder and welding operator tests shall be witnessed by the customer or AI.
 - D. Each welder and welding operator shall be assigned a unique identifying number or symbol.
 - E. Welder and welding operator performance qualifications shall be documented on Performance Qualification Test forms and any other form required by the contract. (See Attachment 1 for a typical example.)



TITLE WELDING CONTROL

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4.3 Maintenance of Welder and Welding Operator Qualifications

4.3.1 Qualifications shall be maintained by the Welding & QC Manager in accordance with applicable Code and standards. Maintenance of qualifications shall be updated at least every six (6) months.

4.3.2 Copies of qualifications shall be maintained at jobsites until completion of the work.

5.0 WELDING PROCEDURE SPECIFICATIONS (WPS):

5.1 Instructions for the preparation and writing of WPS's are given in CB&I Standard 830-1. For ASME work, all WPS's shall be qualified to ASME Section IX.

5.1.1 Requirements for WPS's shall be determined after contract review to determine technical requirements for welding procedures.

5.1.2 WPS's shall be standard procedures or prepared for each contract in accordance with contract requirements including referenced Codes or specifications.

5.1.3 Each WPS shall have substantiating Procedure Qualification Records (PQR) to demonstrate the satisfactory performance of the WPS. Depending upon contract requirements, PQR's may be previously qualified or performed new for the specific contract.

5.2 Procedure Qualifications Records (PQR)

5.2.1 Instructions for the preparation and writing of PQR's is given in CB&I Standard 831-1.

5.2.2 PQR's shall include, as a minimum, the following:

- A. Base materials and welding materials.
- B. Records of all essential and nonessential variables.
- C. Results of mechanical and chemical testing.



5.2.2 (con't)

- D. Results of nondestructive examination.
- E. Certification of PQR by a CB&I Welding Engineer.

5.2.3 When required by the contract, preparation, welding, inspection and testing shall be witnessed by the customer or AI.

6.0 CONTROL OF WELDING:

6.1 Assignment of Welders

The assignment of work to welders is the responsibility of the Superintendent (Foreman) who shall consult with the Welding & QC Supervisor to determine that the welders are qualified to perform the work. Welding & QC Supervisors are responsible for advising the Superintendent (Foreman) when a welder is not qualified or lacks training and experience to the degree that sufficient supervision cannot be given to ensure proper results.

6.2 Welding Activities

6.2.1 The Welding & QC Supervisor shall review the WPS and instruct the welder in its use. This instruction may be verbal and/or by demonstration.

6.2.2 Welding & QC Supervisors shall monitor welding for compliance with the WPS and perform inspections required by process control documents.

6.2.3 Documentation of welding verifications and inspections shall be made on process control documents when required.



6.3 Welder Identification:

6.3.1 For weld joints that require identification of the welder, one of the following methods shall be used:

- A) Mark the welders identification number or symbol on or adjacent to and at intervals of not more than 3 feet along the welds they make, or
- B) Make a record of the welders used on each joint.

6.3.2 When marking of the joints is used for welder identification, it shall be made with steel stencils, using low stress dies, unless the material is less than 1/4" in thickness (1/2" for nonferrous materials), in which case, paint or ink markers shall be used.

6.3.3 For ASME Work:

- A) All pressure boundary joints require welder identification.
- B) Permanent nonpressure part attachment welds and/or tack welds that become part of the final pressure boundary weld only require group welder identification. The welders identification may be grouped and listed in a table format on a single process control document, provided the same welding procedure is utilized.

6.4 Welders not in the employ of CB&I may be used to weld components provided all of the following conditions are met:

- A) All welders shall be qualified by CB&I per 4.0.
- B) All welders shall be assigned a unique identification number or symbol by CB&I.



- C) All welding shall be in accordance with CB&I welding procedures.
- D) All welders shall be completely and exclusively administered and technically supervised by CB&I.
- E) CB&I shall have the authority to assign and remove welders without the involvement of any other organization.

6.5 Tack welds used to secure alignment shall either be removed completely when they have served their purpose, or their stopping and starting ends shall be properly prepared by grinding or other suitable means so that they may be satisfactorily incorporated into the final weld and shall be visually inspected by the Welding & QC Supervisor.

7.0 RECORDS:

- 7.1 WPS's and PQR's are contract records and shall be maintained by the Welding & QC Manager.
- 7.2 Records required by this procedure, other than WPS's and PQR's, are internal records and shall be maintained by the Welding & QC Manager.

8.0 ATTACHMENTS: (Typical)

- 8.1 Attachment 1 - Performance Qualification Test Form
- 8.2 Attachment 2 - Field Receiving Inspection Report for Welding Material



DOC. ID QAP 9.2
 REV. NO. 9
 CONTRACT

TITLE WELDING CONTROL

PAGE NO. 9 OF 10

ATTACHMENT 1

PERFORMANCE QUALIFICATION TEST
 In Accordance with Section IX of the ASME Code - Latest Edition
SHIELDED METAL ARC PROCESS

Material - Spec: _____ of P No. _____ to P No. _____		Record of Utilization	
Weld Procedure Specification Number (WPS): _____		Month / Year	Type of Insp.
Filler Metal (F No.): F: _____			Initials
Filler Metal (SFA) Specification SFA: _____			
Back gouge to clean metal and weld overhead 	This test qualifies all thickness ranges to be welded. OVERHEAD - BOTH SIDES	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1: <input type="checkbox"/> Result 2: <input type="checkbox"/>	
Back gouge to clean metal and weld horizontal 	This test qualifies all thickness ranges to be welded. HORIZONTAL - BOTH SIDES	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1: <input type="checkbox"/> Result 2: <input type="checkbox"/>	
Back gouge to clean metal and weld vertical 	All passes uphill except first pass and wash passes which may be run downhill or uphill. This test qualifies all thickness ranges to be welded. VERTICAL - BOTH SIDES	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1: <input type="checkbox"/> Result 2: <input type="checkbox"/>	
Back gouge to clean metal and weld vertical 	All passes are to be run downhill. This test qualifies range 0" to 3/4" 3/8" SINGLE BEVEL BUTT VERTICAL	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1: <input type="checkbox"/> Result 2: <input type="checkbox"/>	
1. Qualification on butt welds also qualifies welder for flat welds and butt welds with back-up bars. 2. Qualification with F-6 & F-4X electrodes may be made on P-1 test plates. 3. Radiography of a 6" section of plate may be used in lieu of bend test. 4. Qualification with F-4 electrode also qualifies for F-3, F-2, and F-1. 5. Acceptance - 'v' test results include the examination of welded coupon(s) for complete penetration and fusion.			
Date	Location	Social Security No.	Birth Date
			Started CBI Year:
WE CERTIFY THAT THE STATEMENTS MADE IN THIS RECORD ARE CORRECT AND THAT THE TEST WELDS WERE PREPARED, WELDED, AND TESTED IN ACCORDANCE WITH SECTION IX OF THE ASME CODE - LATEST EDITION / AND MAINTAINED FROM THE TIME OF TEST TO THIS DATE.		Address: _____ City: _____ State: _____ Full Name: _____	X = X-Ray V = Visual R = Renewal
CBI REPRESENTATIVE	DATE	First	Middle
			Last

WL 111 (FRONT) REV AUG 93




DOC. ID QAP 9.2
 REV. NO. 9
 CONTRACT

TITLE WELDING CONTROL

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ATTACHMENT 2



**FIELD RECEIVING INSPECTION REPORT
FOR WELDING MATERIALS**

Contract Number _____ CBI Order Number _____

Supplier _____ Manufacturer _____

RECEIVING INSPECTION

Quantity Received and Inspected _____

Size and Type _____

Specification _____

Condition of Material _____

Nonconformity: Yes No

 If yes explain: _____

Explain Disposition: _____

Material Meets Requirements of:

Bill Sheet Purchase Order Requisition

Release for Fabrication: _____ Date _____

(Welding & QC Supervisor)

WL 247 REV DEC 88



DOC. ID QAP 10.1
 REV. NO. 8
 CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR
 ITEMS FROM A SUPPLIER

PAGE NO. 1 OF 10

						BY	DATE		
APPROVED	Engr	Corp	Corp	Const	Mfg	HSB	PREPARED	ALD	12-9-92
	JH	Weld	QA	LBR	AGR	CMD	REVISED	RWK	1-16-98
				JDM	JCV		AUTHORIZED	<i>RWK 2/23/98</i>	
				DAD	WJS		REFERENCED		
							STANDARD	---	REV. NO. -

Extensively Revised

1.0 SCOPE:

This procedure describes the receipt, inspection and release of items from a supplier (see QAP 9.2 for additional requirements for welding materials).

2.0 RESPONSIBILITIES:

- 2.1 Purchasing is responsible for records relating to purchased items including receiving inspection reports (RIRs), supplier documentation and releasing items for use that require an RIR or a preliminary release.
- 2.2 Shop or Field QC may assume Purchasing's responsibilities per this QAP.
- 2.3 Receiving personnel, who report to the Superintendent, are responsible for receipt inspections and releasing items for use that do not require an RIR.
- 2.4 The Welding & QC Manager is responsible for resolving nonconformities and for releasing items that require a nonconforming release.

3.0 PROCEDURE:

3.1 Receipt

- 3.1.1 Purchasing shall send to Receiving a copy of the Purchase Order (PO), if not available electronically, and any sketches or drawings required for receipt.



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TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 2 OF 10

- 3.1.2 Purchasing shall initiate RIRs (see Attachment 1) and Material Verification Summary Sheets (MVSSs) (see Attachment 2) when required per CB&I Standard 607-3 and send the RIRs to the Receiving location.
- 3.1.3 When operations and tests are required to be performed to make the item acceptable per the material specification and they are to be performed by CB&I after receipt, Purchasing shall note these requirements under the nonconformities section of the RIR.
- 3.1.4 For direct shipments to the field, Purchasing shall send the necessary receiving documents to the Project Manager who shall forward them on to the jobsite.
- 3.1.5 When items are received from a supplier, Receiving personnel shall obtain any documentation supplied with the items.
- 3.1.6 Receiving personnel shall perform receipt inspections immediately upon receipt of an item(s) or shall segregate the item(s) until a receipt inspection can be performed.
- 3.1.7 Receiving personnel shall check to see that they have the required information for the items from Purchasing. This includes the PO, if no electronic access, including any sketches or drawings, and, when required, the RIR.
- 3.2 Inspection and Release of Items from a supplier, when an RIR is not required (See flowchart in 6.1):
- 3.2.1 Receiving personnel shall check the items for compliance with the PO and any sketches or drawings, that they were not damaged during shipment, and are properly identified.
- 3.2.1.1 If the items are acceptable, this shall be noted on the PO, shipping documents or electronically and the items released for use.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 3 OF 10

- 3.2.1.2 If any of the items are unacceptable, the reason shall be noted on the PO, shipping documents or electronically and the items tagged or marked "hold" or placed in a designated hold area.
- 3.2.1.3 All technical documents accompanying the shipment such as Material Test Reports (MTRs), Certificates of Conformance (COCs), etc. shall be forwarded to Purchasing.
- 3.2.1.4 For locations without electronic access, the shipping documents shall be forwarded to Purchasing.
- 3.2.1.5 For direct shipments to the Field, the shipping documents shall be sent to the Project Manager who shall either forward them on to Purchasing or acknowledge the items receipt electronically.
- 3.2.2 Clerical errors in paperwork and marking or identification discrepancies shall be resolved with the supplier by Purchasing.
- 3.2.3 If an item is unacceptable and it is not to be rejected and returned to the supplier, Purchasing shall fill out an RIR on the item and initiate the nonconformities section. The RIR and any applicable documentation shall be forwarded to the Welding & QC Manager for disposition.
- 3.3 Inspection and release of items from a supplier, when an RIR is required (See flowchart in 6.2):
 - 3.3.1 Receiving personnel shall check the items for compliance with the PO and any sketches and drawings, that they were not damaged during shipment, are properly identified and shall perform and document all the checks required by the RIR. See CB&I Standard 607-3-3.



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REV. NO. 8
CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 4 OF 10

- 3.3.1.1 If the items are acceptable, the completed RIRs shall be forwarded to Purchasing and the items held pending final release.
- 3.3.1.2 If any of the items are unacceptable, the reason shall be noted on the RIR and the item tagged or marked "hold" or placed in a designated hold area. The completed RIRs shall be forwarded to Purchasing for disposition.
- 3.3.1.3 All technical documents accompanying the shipment such as Material Test Reports (MTRs), Certificates of Conformance (COCs), etc. shall be forwarded to Purchasing.
- 3.3.1.4 For direct shipments to the Field, the RIR and any shipping documents shall be sent to the Project Manager who shall forward the RIR on to Purchasing, and either acknowledge the items receipt electronically or also forward the shipping documents.
- 3.3.2 Upon receiving the completed RIRs and any technical documents from Receiving, Purchasing shall release the items for use, by signing the "Material Released for Fabrication" block, if the results of the receipt inspection and the check of the suppliers documentation (Manufacturer's Data Reports, MTRs or COCs (via hardcopy or electronic transfer), NDE reports, etc.) are acceptable. A copy of the released RIR shall be forwarded to Receiving.
- 3.3.3 Clerical errors in paperwork, marking, or identification discrepancies shall be resolved with the supplier by Purchasing.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 5 OF 10

3.3.4 If an item is nonconforming and it is not to be rejected and returned to the supplier, the nonconformities section of the RIR shall be initiated by Purchasing. The RIR and any applicable documentation shall be forwarded to the Welding & QC Manager for disposition.

3.4 Preliminary Release

3.4.1 In special circumstances, i.e., when the item meets the PO requirements but the supplier's documentation or markings are deficient and the item needs to be used, Purchasing may preliminarily release the item provided it is positively identified so that, in the event of a nonconformity, it can be located and held for disposition. See CB&I Standard 607-3-3.

3.4.2 For items to be preliminary released, Purchasing shall indicate a preliminary release in the "Material Released for Fabrication" block. A copy of the RIR shall be sent to Receiving and to the Welding & QC Manager. The Welding & QC Manager shall establish controls to positively identify the item.

3.4.3 When Purchasing resolves the deficient documentation or markings, the final release on the RIR shall be signed and a copy sent to the Welding & QC Manager.

3.5 Nonconforming Release

3.5.1 Nonconforming items may be released by the Welding & QC Manager for use if it is determined that the nonconformity is likely to be resolved, provided the item is positively identified so that it can be located and removed if the nonconformity cannot be resolved. See CB&I Standard 607-3-3.



DOC. ID QAP 10.1
REV. NO. 8
CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR PAGE NO. 6 OF 10
ITEMS FROM A SUPPLIER

3.5.2 For items to be released nonconforming, the Welding & QC Manager shall indicate a nonconforming release in the "Material Released for Fabrication" block. A copy of the RIR shall be sent to Receiving and Purchasing. The Welding & QC Manager shall establish controls to positively identify the item.

3.5.3 When the Welding & QC Manager resolves the nonconformity, the final release on the RIR shall be signed and the RIR sent to Purchasing.

4.0 RECORDS:

Records generated per this procedure are contract records and shall be maintained by Purchasing per CB&I Standard 590-1-4.

5.0 ATTACHMENTS: (Typical)

5.1 Attachment 1 - Receiving Inspection Report

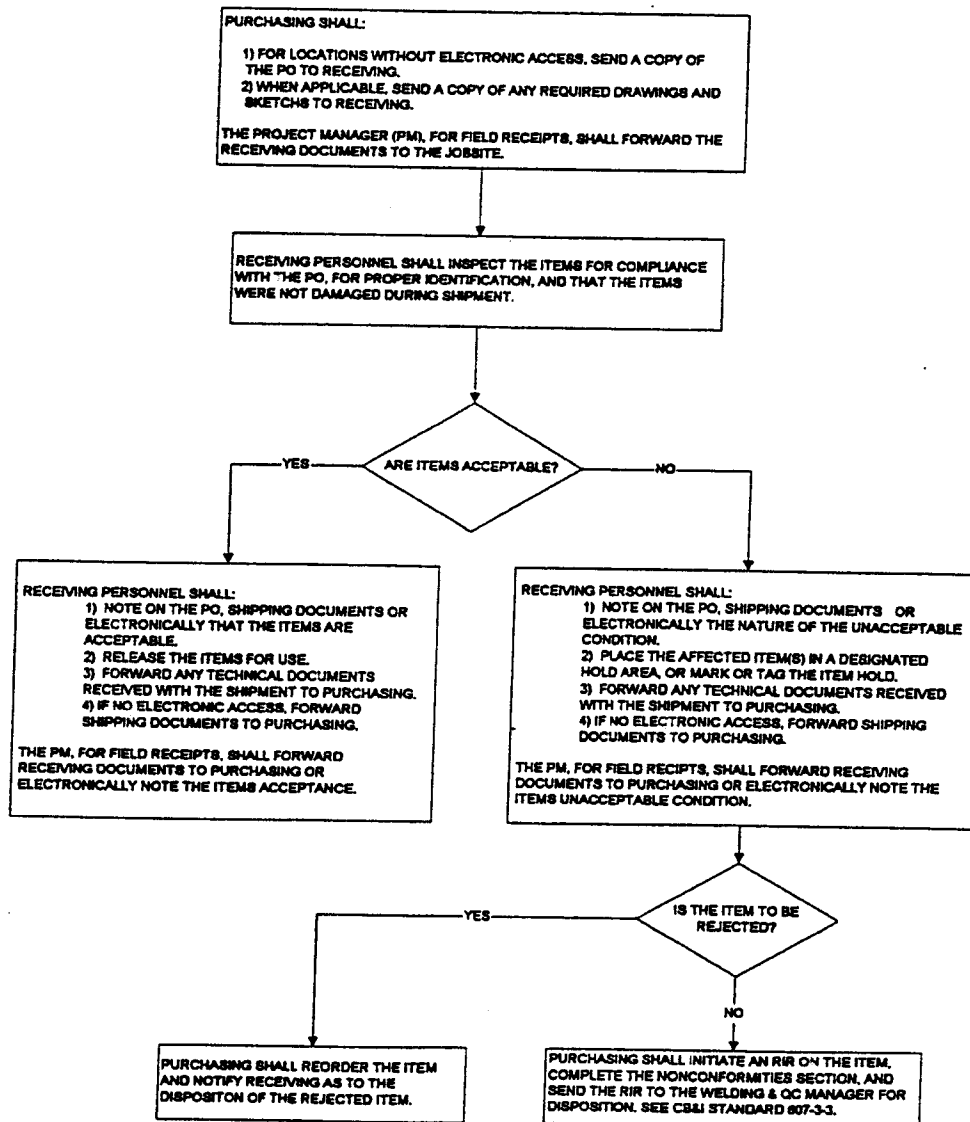
5.2 Attachment 2 - Material Verification Summary Sheet



6.0 FLOWCHARTS:

6.1 Flowchart:

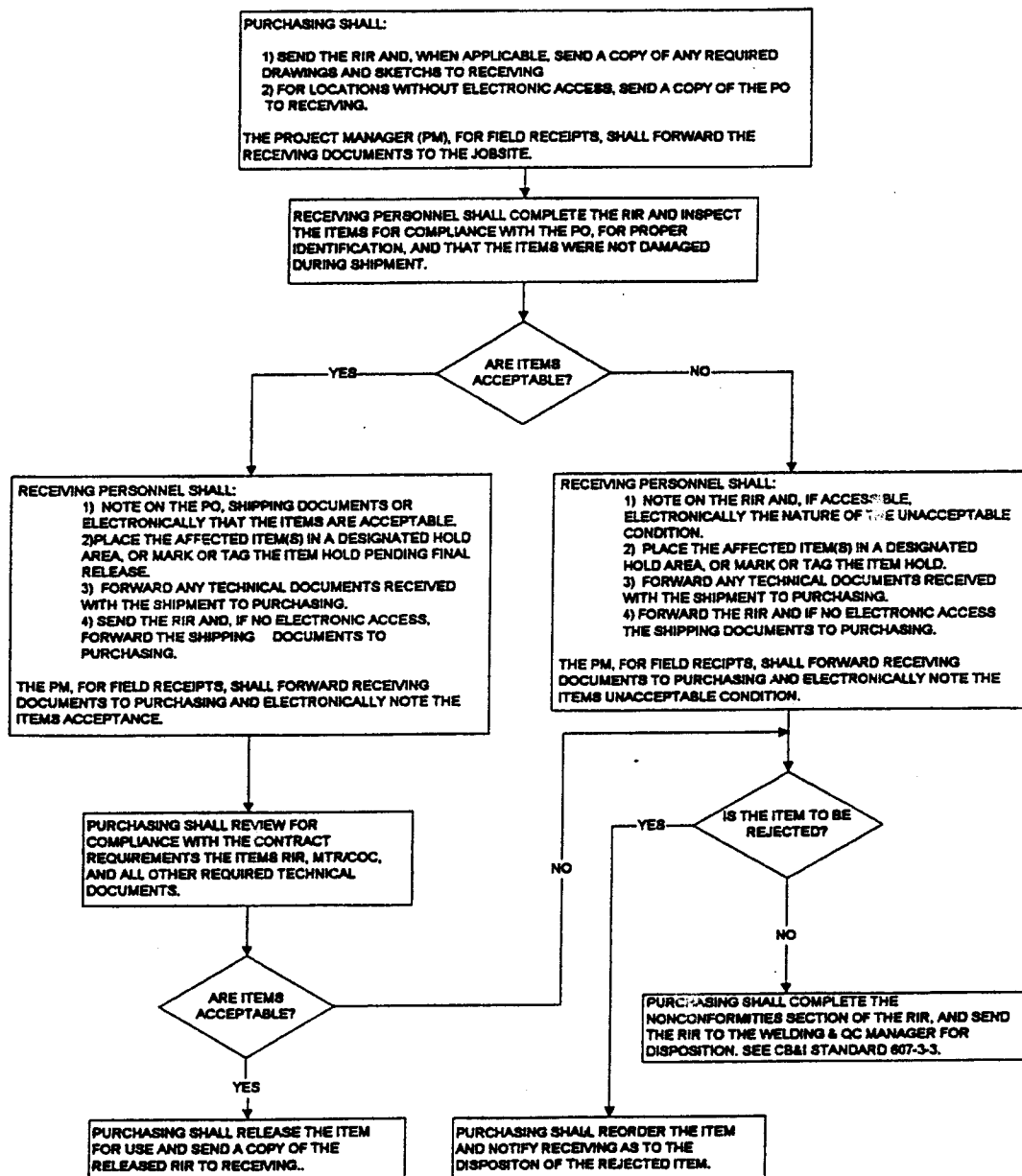
**INSPECTION AND RELEASE OF ITEMS FROM A SUPPLIER,
WHEN AN RIR IS NOT REQUIRED**





6.2 Flowchart

INSPECTION AND RELEASE OF ITEMS FROM A SUPPLIER,
WHEN AN RIR IS REQUIRED





DOC. ID QAP 10.1
 REV. NO. 8
 CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR
 ITEMS FROM A SUPPLIER

PAGE NO. 9 OF 10

ATTACHMENT 1

**METAL RECEIVING
 INSPECTION REPORT**

Contract No. _____
 CBI Order No. _____
 Supplier _____
 Ordered Item No. _____ Quan. Ordered _____
 Material Spec. _____
 Description _____
 Initiated By _____ Date _____

ROUTE TO	BY	DATE	FOR

RECEIVING INSPECTION: From Information on Material

Carrier or Car or Truck No. _____ Quantity Received _____
 Quantity Inspected _____ Partial Complete
 Material Spec. (Marked on Material) _____
 Supplier ID No. (Heat, Slab, Lot, Serial, Etc.) _____

Width OK Yes No See "Nonconformities"
 Length OK Yes No See "Nonconformities"
 Size OK Yes No See "Nonconformities"
 Surface OK Yes No See "Nonconformities"

FOR HEAT TREATED PLATE:

Purchasing to Check (X) Applicable Mill Stamping
 Mill Heat Treated Stamped MT Yes No
 CBI to Heat Treat Stamped G Yes No
 Nonconformities if "Yes", Explain Yes No

Thickness Record or Sketch

x
x
x
x

Material is held for Disposition Yes No
 Reported By _____ Date _____ Ident. No. of Micrometer or Thickness Gage Used _____

NONCONFORMITIES
 (For Material as Received)
 Description (By Purchasing) _____

By CBI Before Material Meets the Specification and is Released For Use:
 Heat Treatment - Yes MT - Yes UT - Yes PT - Yes
 No No No No

Other: _____
 Processed By _____ Date _____

Disposition (By QC) _____

Approved By _____ Date _____
 QC
 Disposition of Nonconformity Completed By _____ Date _____

MATERIAL RELEASED FOR FABRICATION

Purchasing _____ Date _____

FILE NO.

Printed in USA See Standard 607-3-3 for instructions on using this form GD 589 REV JAN 97



DOC. ID QAP 10.5
 REV. NO. 0
 CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR
 ITEMS FROM A CB&I SHOP

PAGE NO. 1 OF 5

APPROVED	Engr	Corp	Corp	Const	Mfg	HSB	BY	DATE
		Weld	QA					
	JH			LBR	AGR	CMD	PREPARED	RWK 1-16-98
				JDM	JCV		REVISED	
				DAD	WJS		AUTHORIZED	<i>RWK 2/23/98</i>
							REFERENCED	
							STANDARD	--- REV. NO. -

1.0 SCOPE:

This procedure describes the receipt, inspection and release of items from a CB&I shop (see QAP 9.2 for additional requirements for welding materials).

2.0 RESPONSIBILITIES:

- 2.1 Receiving personnel, who report to the Superintendent, are responsible for receipt inspections and releasing items for use.
- 2.2 The Welding & QC Supervisor is responsible for the disposition of unacceptable items involving shipments requiring only a packing list.
- 2.3 The Welding & QC Manager is responsible for the disposition of unacceptable items involving shipments requiring a Shop Release for Shipment Checklist (SRSCL).

3.0 PROCEDURE:

3.1 Receipt

- 3.1.1 When items are received from a CB&I shop, Receiving personnel shall obtain any documentation supplied with the items.
- 3.1.2 Receiving personnel shall perform receipt inspections immediately upon receipt of an item(s) or shall segregate the item(s) until a receipt inspection can be performed.
- 3.1.3 Receiving personnel shall check to see that they have the packing list and, if required, the SRSCL. See QAP 15.1.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A CB&I SHOP PAGE NO. 2 OF 5

3.2 Inspection and Release of Items from a CB&I Shop, when a SRSCL is not required (See flowchart in 5.1):

3.2.1 Receiving personnel shall inspect the items against the packing list to assure that the items are properly identified and were not damaged during shipment.

3.2.2 If the items are acceptable, this shall be noted on the packing list, the items released for use, and the packing list forwarded to the Superintendent (Foreman).

3.2.3 If any of the items are unacceptable, the reason shall be noted on the packing list and the item tagged or marked "hold" or placed in a designated hold area. The packing list shall be forwarded to the Welding & QC Supervisor for the disposition of these conditions.

3.2.4 The Welding & QC Supervisor shall evaluate the items reported condition to determine it's disposition.

A) If the disposition is that the condition is not nonconforming, the Welding & QC Supervisor shall notify the Superintendent (Foreman) as to what methods or procedures may be followed to correct the condition.

B) If the disposition is that the condition is nonconforming, it shall be handled per QAP 13.1.

3.3 Inspection and release of items from a CB&I shop, when a SRSCL is required (See flowchart in 5.2):

3.3.1 Receiving personnel shall inspect the items against the SRSCL to assure that the items are properly identified and were not damaged during shipment.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR PAGE NO. 3 OF 5
ITEMS FROM A CB&I SHOP

- 3.3.2 If the items are acceptable, the "Receiving Shop or Field" column of the SRSCL is signed off, the items released for use, and the SRSCL forwarded, as applicable, to the Shop Welding & QC Manager or Field Welding & QC Supervisor.
- 3.3.3 If any of the items are unacceptable, the reason shall be noted on the SRSCL and the item tagged or marked "hold" or placed in a designated hold area. The SRSCL shall be forwarded to the Welding & QC Manager for the disposition of these items.
- 3.3.4 The Welding & QC Manager shall evaluate the items reported condition to determine it's disposition.
- A) If the disposition is that the condition is not nonconforming, the Welding & QC Manager shall notify the Welding & QC Supervisor and Superintendent (Foreman) as to what methods or procedures may be followed to correct the condition.
 - B) If the disposition is that the condition is nonconforming, it shall be handled per QAP 13.1.
 - C) For ASME work, shipping damage, identification discrepancies, or deficiencies shall be considered nonconformities. See QAP 13.1.

4.0 RECORDS:

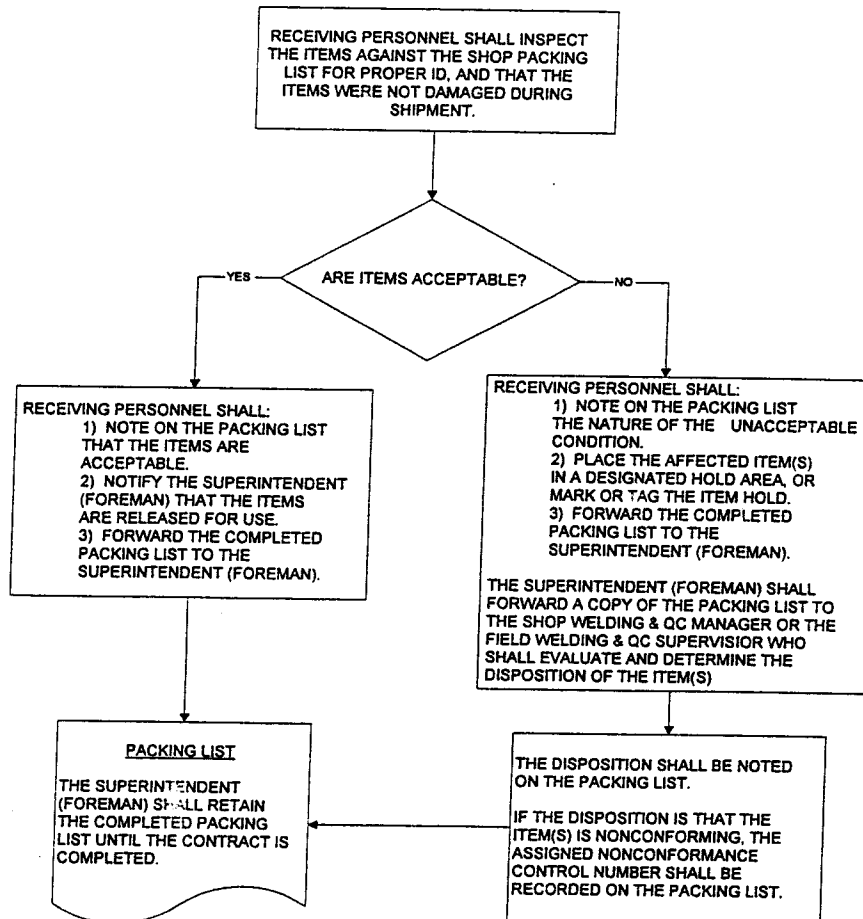
- 4.1 The Superintendent (Foreman) shall maintain the Packing Lists until the completion of the contract.
- 4.2 The Shop Welding & QC Manager or Field Welding & QC Supervisor shall maintain the SRSCLs until the completion of the contract.



5.0 FLOWCHARTS:

5.1 Flowchart

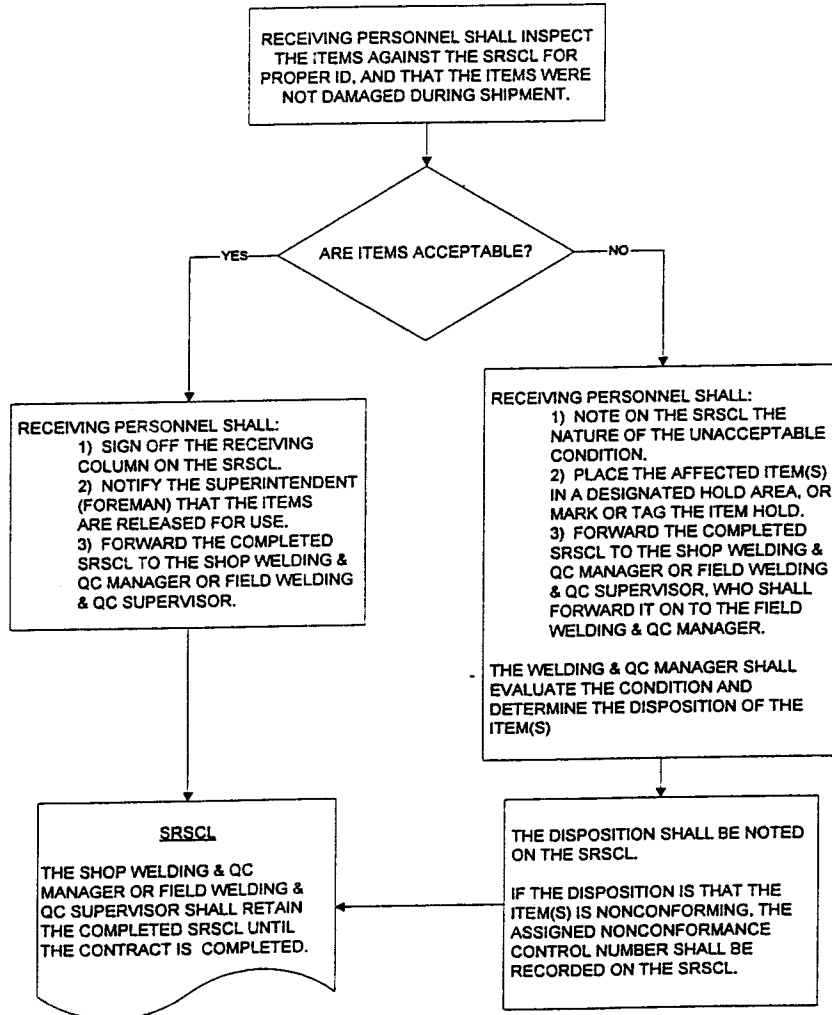
INSPECTION AND RELEASE OF ITEMS FROM A CB&I SHOP,
WHEN A SRSCL IS NOT REQUIRED





5.2 Flowchart

INSPECTION AND RELEASE OF ITEMS FROM A CB&I SHOP,
WHEN A SRSCl IS REQUIRED





DOC. ID QAP 15.1
 REV. NO. 5
 CONTRACT

TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION PAGE NO. 1 OF 7
 AND DELIVERY

	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	BY	DATE
				JDM	AGR	CMD	PREPARED	REK 8-19-92
				LBR	WJS		REVISED	RWK 1-15-98
APPROVED				DAD			AUTHORIZED	<i>RWK 2/23/98</i>
							REFERENCED	
							STANDARD	REV. NO.

Extensively Revised

1.0 SCOPE:

This procedure describes the handling, storage, preservation and shipment (delivery) of materials and items. The storage and preservation of welding materials shall be per QAP 9.2.

2.0 RESPONSIBILITIES:

2.1 The Superintendent (Foreman) is responsible for the proper handling, storage, packaging, preservation, and shipment of materials and items. Standard handling, storage, packaging, preservation, and shipping requirements are the responsibility of each shop and construction organization and includes CB&I standards, procedures, and verbal instructions.

2.2 The Project Manager or Construction Supervisor is responsible for the preparation, when required, of any special contract procedures and/or instructions necessary to cover any specialized handling, storage, packaging, preservation, or shipping requirements.

2.3 The Welding & QC Manager is responsible for releasing items for shipment that require a Shop Release for Shipment Checklist (SRSCl).

3.0 HANDLING:

3.1 Material and items shall be safely handled and protected using pallets, containers, conveyers, cranes, hoists, vehicles or any other methods as required to prevent damage or deterioration.

3.2 Equipment and devices shall be inspected for proper operation and cleanliness as appropriate to avoid damage or contamination to the products.



TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION PAGE NO. 2 OF 7
AND DELIVERY

3.3 Operator qualifications are controlled by the Superintendent (Foreman). When operators of handling equipment are required to be qualified, copies of their qualifications shall be maintained onsite until the completion of the work.

4.0 STORAGE:

4.1 All material shall be properly stored and/or segregated in designated areas or stockrooms to prevent damage or deterioration from the weather or nearby operations.

4.1.1 Storage may be in enclosed areas or outdoors depending upon the nature of the item (e.g., size, shape, weight, material, duration of storage, etc.).

4.1.2 Stockrooms and special storage containers shall be kept locked if necessary.

4.2 The receipt and dispatch of materials to and from storage areas shall be performed by assigned personnel.

5.0 PACKAGING AND PRESERVATION:

5.1 All materials requiring packaging shall be suitably packaged to avoid damage or deterioration during storage or shipment.

5.2 Any special methods for cleaning, packing and preservation including the details for moisture elimination, cushioning, blocking and crating shall be performed in accordance with written procedures and/or instructions.

5.3 All packaging shall be marked to maintain identification of contents.

6.0 SHIPMENT:

6.1 All materials and items shall be suitably protected to avoid damage or deterioration during shipment.

6.2 Procedures and/or instructions including sketches showing packing and loading arrangements, location of tie downs and any required exterior protection shall be prepared, as needed, to prevent damage or loss of materials and items during shipment.



- 6.3 The Superintendent (Foreman) shall inspect material and items, against the applicable drawings, requisitions, process control documents, etc. to assure the material and items are in conformance and that all required inspections and tests are completed and acceptable. For material and items that are acceptable, the Superintendent (Foreman) shall prepare a delivery/packing list (See attachment 1).
- 6.4 For material and items that do not require a SRSCl, the Superintendent (Foreman) shall release the material and items for shipment. The Superintendent (Foreman) shall send copies of the delivery/packing list with the shipment and to the Project Manager.
- 6.5 For material and items requiring a SRSCl (See attachment 2), the Welding & QC Manager shall release the material and items for shipment. The Superintendent (Foreman) shall notify the Welding & QC Manager when material and items that require a SRSCl are ready for shipment.
- 6.6 The Welding & QC Manager shall initiate a SRSCl and inspect all material and items required to be listed on a SRSCl to ensure they have been manufactured and documented per the applicable code, customer, CB&I, and QAM requirements. See CB&I Standard 607-3-3.
- 6.6.1 For ASME work, the SRSCl shall be presented to the AI for the AI's concurrence that the listed material and items are in compliance with Code requirements and released for shipment. The AI's signature on the SRSCl indicates to the AI in the field that the Material Test Reports or Certificates of Compliance have been reviewed and welded assemblies are in compliance with the code.
- 6.6.2 When required, the SRSCl, shall be presented to the customer for concurrence that the listed material and items are in compliance with contract requirements and released for shipment.



TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION PAGE NO. 4 OF 7
AND DELIVERY

6.7 The Welding & QC Manager shall send the original SRSCL to the Field Welding & QC Manager and a copy to the Superintendent (Foreman) releasing the material and items for shipment. The Superintendent (Foreman) shall send a copy of the delivery/packing list and SRSCL along with the shipment.

6.8 For ASME work, items originally planned to be shop assembled may be field assembled and vice versa without revising the drawings or requisitions, if agreed to by the Project Manager, Engineering-Assigned, and the Manufacturing and Construction Welding & QC Managers. Such agreements shall be noted on the SRSCL and in these cases a copy of the SRSCL shall be sent to the Project Manager and the Construction Welding & QC Manager.

7.0 MONITORING:

When material and items are expected to be stored for extended periods of time, the Superintendent (Foreman) shall perform periodic checks on the stored items to ensure they are being stored in accordance with the applicable instructions.

8.0 DAMAGE OR DETERIORATION:

Damaged or deteriorated material and items shall be reported to the Superintendent (Foreman) for disposition. If the Superintendent (Foreman) decides the material or item is not to be rejected and it cannot be repaired or reworked per an existing approved procedure, the Welding & QC Manager shall be notified for the disposition.

9.0 RECORDS:

9.1 The Superintendent (Foreman) shall maintain copies of the Delivery/Packing Lists until the completion of the contract.

9.2 The Shop Welding & QC Manager or Field Welding & QC Supervisor shall maintain the SRSCLs until the completion of the contract.



DOC. ID QAP 15.1
REV. NO. 5
CONTRACT

TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY PAGE NO. 5 OF 7

9.3 Contract procedures and instructions generated per this QAP are contract records and shall be maintained by the Superintendent (Foreman) until the completion of the contract.

10.0 ATTACHMENTS (Typical):

10.1 Attachment 1 - Packing List

10.2 Attachment 2 - Shop Release for Shipment Checklist



DOC. ID QAP 15.1
 REV. NO. 5
 CONTRACT

TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION PAGE NO. 7 OF 7
 AND DELIVERY

ATTACHMENT 2

SHOP RELEASE FOR SHIPMENT CHECK LIST

NO PCS	PIECE MARK	HEAT SERIAL CODE	ITEM CLASS LEVEL	THESE COLUMNS FILLED IN AT OPTION OF SHIPPING LOCATION			SHIPPING		RECEIVING	
				B.S. LINE NO.	DESCRIPTION	WEIGHT	INSPECTED BY	DATE	INSPECTED BY	DATE
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

NOTES: (Please note with "S" for shipping location or "R" for receiving location to indicate originator of field)

TO THE BEST OF MY KNOWLEDGE, THE LISTED ITEMS HAVE BEEN MANUFACTURED AND DOCUMENTED ACCORDING TO THE APPLICABLE CBI QUALITY ASSURANCE MANUAL AND MEET APPLICABLE CODE AND CUSTOMER REQUIREMENTS, EXCEPT AS NOTED

CBI SHOP CODE _____ DATE _____

REVIEWED: _____ DATE _____

CUSTOMER INSPECTOR _____

REVIEWED (FOR CODE COMPLIANCE): _____

AI/ANI (Shop) _____ DATE _____

MADE BY _____ DATE _____

APPD BY _____ DATE _____

BY _____ DATE _____

APPD _____ DATE _____

SHIPMENT NO. _____ CONTRACT NO. _____

SH _____ OF _____

GO 001 REV JAN 95



DOC. ID QAP 16.2
 REV. NO. 3
 CONTRACT

TITLE QUALITY RECORDS FOR ASME
 AND NBIC WORK

PAGE NO. 1 OF 2

						BY	DATE		
APPROVED	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	PREPARED	REK	10-10-95
	JH			LBR	AGR	CMD	REVISED	RWK	1-29-98
				JDM	JCV		AUTHORIZED	<i>RWK 2/26/98</i>	
				DAD			REFERENCED		
							STANDARD	---	REV. NO. -

Extensively Revised

1.0 SCOPE:

This procedure describes the accumulation, control, retention and protection of completed quality records for ASME and NBIC work. Except as modified herein, these requirements are in addition to QAP 16.1.

2.0 GENERAL:

2.1 The following code records shall be retained indefinitely by Engineering-Assigned:

1. Manufacturer's Data Reports/Partial Data Reports or National Board Registration forms.
2. Supplier Partial Data Reports, if applicable.
3. Design Reports for Section VIII, Division 2 Products.
4. User's Design Specification for Section VIII, Division 2 Products
5. Manufacturing Procedures (NDE, Welding, PWHT and Pressure Test) for Section VIII Division 2 Products.
6. Material Certification Records (MTRs & COCs) and Material Verification Summary Sheets (MVSSs) for Section VIII, Division 2 Products.
7. Material Specifications (MSs) for Section VIII, Division 2 Products.
8. Material Repair Records for Section VIII, Division 2 Products.
9. Drawings for Section VIII, Division 2 Products.

2.2 Radiographs for Section I Products shall be retained for five years by the assigned Welding & QC Manager.



DOC. ID QAP 16.2
REV. NO. 3
CONTRACT

TITLE QUALITY RECORDS FOR ASME
AND NBIC WORK

PAGE NO. 2 OF 2

- 2.3 All other quality records not listed above shall be retained or transmitted to the responsible party for retention as required by CB&I Standard 590-1-4.
- 2.4 When transmitting any required quality records to Engineering-Assigned for retention, the Responsible Manager shall place the records in folders and list them on an index or cover letter specifying the folders and types of records included.
- 3.0 RESPONSIBILITIES FOR THE COLLECTION, PROTECTION AND MAINTENANCE OF QUALITY RECORDS:
- 3.1 Purchasing is responsible for Purchasing and Supplier quality records.
- 3.2 The Shop Welding & QC Manager is responsible for the shop quality records.
- 3.3 The Field Welding & QC Supervisor is responsible for the jobsite quality records until the completion of the contract and then for transmitting them to the Construction Welding & QC Manager.
- 3.4 The Construction Welding & QC Manager is responsible for the jobsite quality records.
- 3.5 Engineering-Assigned is responsible for Engineering quality records.
- 4.0 ASSEMBLY AND TRANSMITTAL OF QUALITY RECORDS TO THE PURCHASER:
- When the Purchaser requires copies of quality records, Engineering-Assigned is responsible for assembling them into a Pressure Vessel Booklet (PVB) and transmitting the completed PVB to the Purchaser.



DOC. ID QAP 18.2
 REV. NO. 3
 CONTRACT

TITLE TRAINING AND QUALIFICATION REQUIREMENTS
 OF PERSONNEL

PAGE NO. 1 OF 6

					BY	DATE	
APPROVED	Engr	Corp Weld	Corp QA	Const	Mfg	PREPARED	RAJ 6-15-95
				LBR	AGR	REVISED	RWK 3-2-98
				JDM		AUTHORIZED	<i>RWK 3/16/98</i>
						REFERENCED	
					STANDARD	--- REV. NO. -	

1.0 SCOPE:

This procedure contains the training and qualification requirements for individuals that effect quality. This procedure is not applicable to personnel trained and qualified in accordance with an approved specific organizational procedure per QAP 18.1.

2.0 RESPONSIBILITIES:

Managers are responsible to provide individuals in their organization with the necessary training and experience to properly perform their duties, provide any required certifications and maintain qualification, training and, if required, certification records.

3.0 PROCEDURE:

3.1 Individuals shall be trained and have sufficient experience to properly perform the duties of their position. Trainees may perform the duties of a position, so long as they are supervised by an individual qualified for the position.

3.2 Individuals shall be trained in the Quality Management System (QMS) requirements, including subsequent revisions related to their duties and assignments. This training shall include familiarization with the QAM, QAPs and CB&I Standards (referenced by QAPs) applicable to their position. See Attachment 1 for minimum QMS training requirements.

3.3 Individuals requiring external certifications, such as State Professional Engineer (PE) licenses, NRC or State Industrial Radiographer Certification, AWS Certified Welding Inspectors (CWI) certifications, NACE certification, etc., shall be certified.



3.4 Process qualification and training:

3.4.1 Welders shall be qualified and certified and records maintained per QAP 9.2.

3.4.2 NDE technicians shall be trained, qualified and certified and records maintained per QAP 10.2.

4.0 RECORDS:

4.1 Position (3.1) qualification and training records:

4.1.1 Managers shall maintain the following:

4.1.1.1 A listing, by position, of any education, training and/or experience requirements determined to be necessary for a specific position.

4.1.1.2 A listing, by individual, of any identified training needs.

4.1.1.3 A signed and dated organization chart of the qualified individuals in their organization by position. The chart shall show the organization's reporting structure and the qualified individuals for the positions shown. See Attachment 2 for an example.

4.1.1.4 Individual training records shall be maintained for those positions identified in 4.1.1.1 above.

4.2 QMS (3.2) training records:

4.2.1 Training in the QAM, QAPs and applicable CB&I Standards shall be documented. The record(s) of required training shall contain as a minimum:

- Subjects covered during the training session
- Individuals name(s) in attendance
- Date of training session
- Name and signature of individual conducting the session



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TITLE TRAINING AND QUALIFICATION REQUIREMENTS PAGE NO. 3 OF 6
OF PERSONNEL

4.2.1 (continued)

See Attachment 3 for an example for a training record.

4.2.2 Training records may be grouped or filed by individual.

4.2.3 Managers shall maintain a signed and dated training matrix that references the current QAM and QAP index revision level documenting the completion of training of individuals in their organization. See Attachment 1 for an example.

4.3 Certification (3.3) records

4.3.1 Managers shall maintain on file the required external certifications of individuals in their organizations.

4.3.2 Certification records may be grouped or filed by individual.

5.0 ATTACHMENTS:

- 5.1 Attachment 1 - QMS Training Matrix
- 5.2 Attachment 2 - Typical Organization Chart
- 5.3 Attachment 3 - Typical Record of Training or Indoctrination Activity



ATTACHMENT 1

Quality Management System Training Matrix

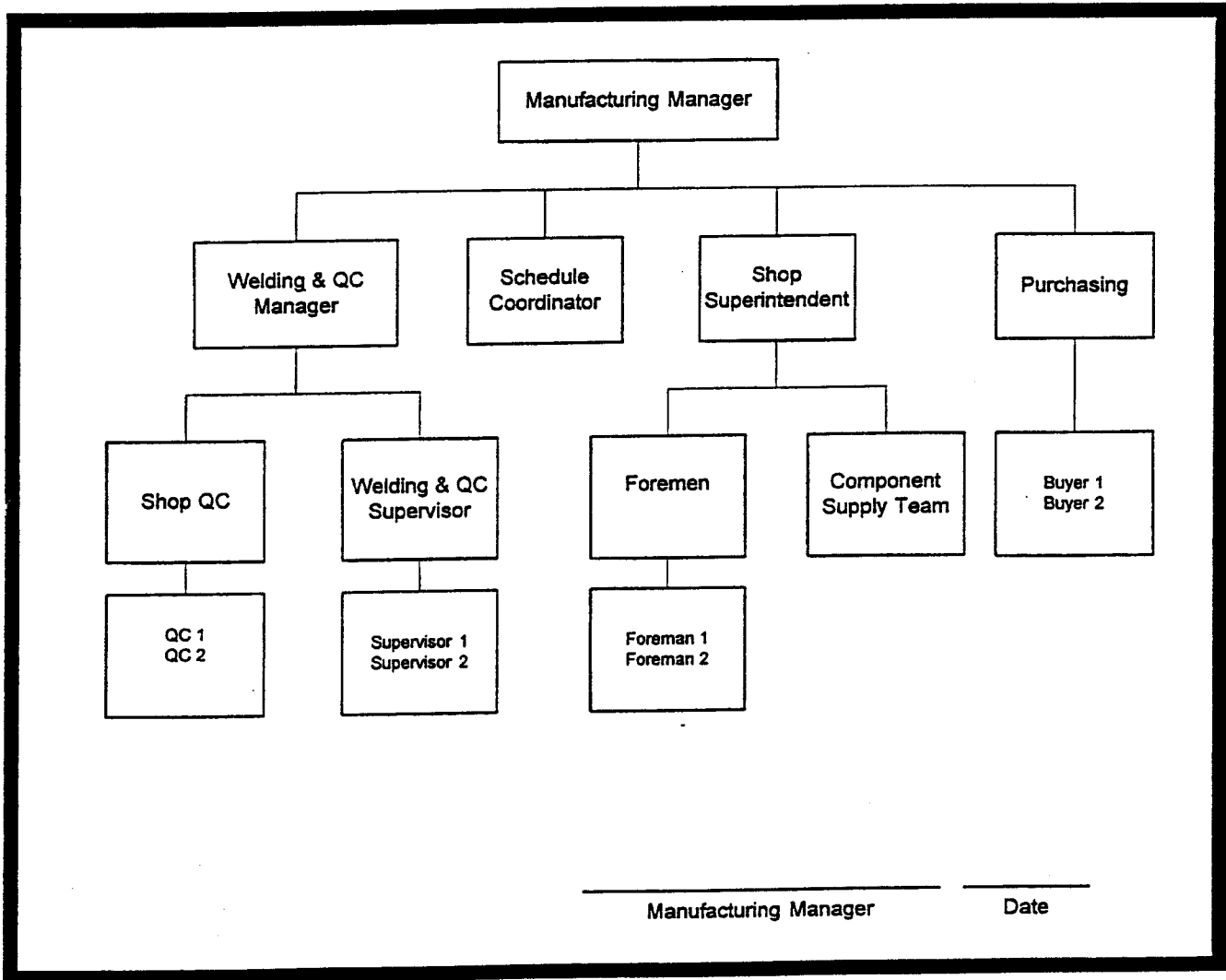
Job Title	Skill Matrix																				Date
	1.1	1.2	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	3.11	3.12	3.13	3.14	
Business Dev. Mgr (BDM)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Contract Dev. Mgr (CDM)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Project Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Comm. Representative	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Organizational/Personnel	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Recruiting personnel	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Weld & QC Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Weld & QC Supervisor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Engr. Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Engr. Team Leader	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Engr. Team Members	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Schedule Coordinator	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Purchasing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Shop or Field QC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Auditors (1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Component Supply Team	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01
Database Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	08/12/01

Manager _____ QAP Revision _____
 Organization _____ QAP Issue Revision _____

*X Training is required
 *X Training is required with QAP, as needed to comply with
 NO 18.2 - Same QAP's reference Red Block Standards. Personnel shall be trained to the referenced Red Block standards at their position in their job function



ATTACHMENT 2
TYPICAL ORGANIZATION CHART





Return to: Chicago Bridge & Iron
P. O. Box 41146
Houston, TX 77241-1146
Attn: R. E. Shelton
Houston CQA

March 18, 1998

DOCUMENT TRANSMITTAL

**Quality Assurance Procedures (QAP's)
for ANSI/ASQC Standard Q9001 (ISO 9000)**

**TO: Larry K. Jones
California Institute of Technology
Controlled Copy Number - 201**

FROM: R. E. Shelton - Houston CQA

Attached is the "Index for CB&I Quality Assurance Procedures", Revision 17 dated March 16, 1998 along with the changed QAP's as listed on the index.

Also attached is the "QAP Changes for Index Revision 17" which summarizes the changes.

Acknowledge receipt of these documents by signing below and returning one copy of this transmittal to R. E. Shelton (Houston CQA) by April 17, 1998. If you wish, you may respond by E-Mail. When using E-Mail, please be sure to refer to the copy number(s) you received.

If you have any questions, call Robert Shelton (713-896-3729) or Ron Kruzic (713-896-5917).

A handwritten signature in cursive script, appearing to read "Larry K. Jones", is written above a horizontal line.

SIGNATURE

4/20/98

DATE

cc: RWK/JCJ/1113-2-1 (Distribution)
F/U: 4-17-98

QAP's for ANSI/ASQC Standard Q9001
Changes for Index Revision 17

The following QAP's have been revised. Except for those QAP's that are new or extensively revised, a documented review of this summary sheet for the revised QAP's by the applicable individuals may be used for their indoctrination/training to these QAP's.

QAP 9.2 Rev. 9

1. Revised "Welder Identification" in 6.3.
2. Added new 6.4 concerning using welders that are not employed by CB&I.

QAP 10.1 Rev. 8

This procedure has been extensively revised.

QAP 10.5 Rev. 5

New procedure for "Receiving Inspection Requirements for Items from a CB&I Shop".

QAP 15.1 Rev. 5

This procedure has been extensively revised.

QAP 16.2 Rev. 3

This procedure has been extensively revised.

QAP 18.2 Rev. 3

Added QAP 10.5 to training matrix in Attachment 1

INDEX FOR CB&I
QUALITY ASSURANCE PROCEDURES

SECTION 6 PURCHASING

QAP 6.1	Rev. 8	Procurement Documents
QAP 6.2	Rev. 4	Supplier Survey
QAP 6.3	Rev. 5	Supplier Review
QAP 6.4	Rev. 2	Supplier Control

SECTION 7 PURCHASER SUPPLIED PRODUCT

QAP 7.1	Rev. 5	Receipt of Customer Supplied Material When the Customer is Responsible for Verification of Material
QAP 7.2	Rev. 3	Receipt of Customer Supplied Material When CBI is Responsible for Verification of Material

SECTION 8 PRODUCT IDENTIFICATION AND TRACEABILITY

QAP 8.1	Rev. 5	Material Control, Identification and Traceability
QAP 8.2	Rev. 0	Unique Material Identification

SECTION 9 PROCESS CONTROL

QAP 9.1	Rev. 5	Process Control
* QAP 9.2	Rev. 9	Welding Control
QAP 9.3	Rev. 5	Heat Treating
QAP 9.4	Rev. 4	Control of Procedures

SECTION 10 INSPECTION AND TESTING

* QAP 10.1	Rev. 8	Receiving Inspection Requirements for Items from a Supplier
QAP 10.2	Rev. 6	NDE, Inspection and Testing
QAP 10.3	Rev. 5	Final Inspection
QAP 10.4	Rev. 5	Data Reports and Stamping for ASME Work
+ QAP 10.5	Rev. 0	Receiving Inspection Requirements for Items from a CB&I Shop

SECTION 11 INSPECTION, MEASURING AND TEST EQUIPMENT

QAP 11.1	Rev. 2	Calibration
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SECTION 12 INSPECTION AND TEST STATUS

QAP 12.1	Rev. 4	Inspection and Test Status
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SECTION 13 CONTROL OF NONCONFORMING PRODUCT

QAP 13.1	Rev. 6	Nonconformities
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QUALITY ASSURANCE PROCEDURES

SECTION 14 CORRECTIVE ACTION

QAP 14.1 Rev. 4 Corrective Action

SECTION 15 HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY

* QAP 15.1 Rev. 5 Handling, Storage, Packaging, Preservation and Delivery

SECTION 16 QUALITY RECORDS

QAP 16.1 Rev. 5 Quality Records
* QAP 16.2 Rev. 3 Quality Records for ASME and NBIC Work

SECTION 17 INTERNAL QUALITY AUDITS

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SECTION 18 TRAINING

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* QAP 18.2 Rev. 3 Training and Qualification Requirements of Personnel
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QAP 19.3 Rev. 1 Repairs, Alterations and Reconstruction of Tanks

SECTION 20 STATISTICAL TECHNIQUES

R. E. Shelton

Houston CQA

March 16, 1998

Date



DOC. ID QAP 9.2
 REV. NO. 9
 CONTRACT

TITLE WELDING CONTROL

PAGE NO. 1 OF 10

	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	BY	DATE
				LBR	AGR	CMD	PREPARED	ALD 12-9-92
				JDM			REVISED	RWK 1-20-98
APPROVED				DAD			AUTHORIZED	<i>CPWK 3/3/98</i>
							REFERENCED	
							STANDARD	--- REV. NO. -

1.0 SCOPE:

This procedure describes the system used to control welding, including tack welding, welding material, procedures and welders.

2.0 RESPONSIBILITIES:

2.1 The Welding & QC Manager coordinates controls relating to welding, preparation of welding procedure specifications (WPS), welding procedure qualifications (PQR), Welding Material Specifications (WMS) and Welding Material Test Specifications (WMT).

2.2 Purchasing is responsible for ordering welding materials.

2.3 The Welding & QC Supervisor controls the use of welding materials and the welding operations at the worksite.

2.4 The Superintendent (Foreman) is responsible for the assignment of welders.

3.0 WELDING MATERIALS:

3.1 Procurement Specifications

3.1.1 Procurement specifications for welding materials provide all technical and quality assurance requirements needed by the supplier.

3.1.2 Procurement specifications are not required for standard readily available materials which are described in SFA material specifications of the ASME Code. They are required when it is necessary to specify additional requirements.



3.1.3 The Welding and QC Manager shall assign an individual to prepare procurement specifications when none are available (WMSs for commonly used welding materials are provided in CB&I Standard 821-1). Identification of the preparer shall be on the specification.

3.1.4 Prior to release, the procurement specification shall be reviewed by the Welding & QC Manager for adequacy of specified requirements.

3.2 Requisitions

3.2.1 Requisitions are prepared by the Welding & QC Manager or by Engineering-Assigned and shall contain technical and quality assurance information needed for procurement. This information may be included on requisitions or included in procurement specifications.

3.2.2 For ASME work, all welding materials shall be purchased to the SFA Material Specifications of the ASME Code. See CB&I Standard 821-1.

3.3 Procurement

The procurement of welding materials shall be initiated by Purchasing in accordance with requisitions from Engineering-Assigned or the Welding & QC Manager.

3.4 Receiving Inspection

Welding materials shall be received, inspected and released in accordance with QAP 10.1, except that the releasing of welding materials requiring a WMS shall be per 3.5.

3.5 Release of Welding Materials Requiring a WMS.



3.5.1 In the shop, the Welding & QC Manager shall release the material for use if the results of the receipt inspection and the check of the Supplier's documentation (Material Test Report (MTR), Certificate of Conformance (COC), etc.) is acceptable. If the welding material is unacceptable, the Welding & QC Manager shall determine the disposition of the material.

3.5.2 In the field, the Welding & QC Supervisor shall release the material for use if the results of the receipt inspection and the check of the Supplier's documentation (Material Test Report (MTR), Certificate of Conformance (COC), etc.) is acceptable. If the welding material is unacceptable, the Welding & QC Manager shall be notified to determine the disposition of the material.

3.5.3 The release shall be documented on a copy of the Purchase Order, a receiving inspection report or a Field Receiving Inspection Report for Welding Materials (see attachment 2).

3.6 Storage of Welding Materials

Storage of welding materials shall be in accordance with CB&I Standard 823 or specific instructions for the contract. As a minimum:

- A. Storage shall be in a clean, dry atmosphere free from effects due to weather.
- B. Welding material shall be organized by type and size.
- C. The welding material storage area shall be secured if necessary to prohibit access by unauthorized personnel.
- D. Nonconforming or non-released welding material shall be segregated if practical and/or clearly marked to indicate that it cannot be issued for use.



3.7 Control of Welding Materials

3.7.1 Selection of the correct welding materials shall be determined by the Superintendent (Foreman) or Welding & QC Supervisor in accordance with contract drawings, welding procedures, process control documents, Bill Sheets and other specific contract instructions.

3.7.2 Welding materials shall be drawn for use under the direction of the Welding & QC Supervisor.

3.7.3 Welding & QC Supervisors shall maintain surveillance over welding operations to ensure usage of the proper welding materials.

4.0 WELDER AND WELDING OPERATOR QUALIFICATIONS:

4.1 Instructions for welder qualifications (includes welding operator) are given in CB&I Standard 839-1. For ASME work, all welders and welding operators shall be qualified to ASME Section IX.

4.2 All welder and welding operator qualifications are controlled by the Welding & QC Manager with the following requirements:

- A. Each welder and welding operator shall be qualified for applicable contract requirements including referenced codes or specifications.
- B. Welder and welding operator tests shall be conducted using a qualified Welding Procedure Specification (WPS).
- C. When required by the contract, welder and welding operator tests shall be witnessed by the customer or AI.
- D. Each welder and welding operator shall be assigned a unique identifying number or symbol.
- E. Welder and welding operator performance qualifications shall be documented on Performance Qualification Test forms and any other form required by the contract. (See Attachment 1 for a typical example.)



4.3 Maintenance of Welder and Welding Operator Qualifications

4.3.1 Qualifications shall be maintained by the Welding & QC Manager in accordance with applicable Code and standards. Maintenance of qualifications shall be updated at least every six (6) months.

4.3.2 Copies of qualifications shall be maintained at jobsites until completion of the work.

5.0 WELDING PROCEDURE SPECIFICATIONS (WPS):

5.1 Instructions for the preparation and writing of WPS's are given in CB&I Standard 830-1. For ASME work, all WPS's shall be qualified to ASME Section IX.

5.1.1 Requirements for WPS's shall be determined after contract review to determine technical requirements for welding procedures.

5.1.2 WPS's shall be standard procedures or prepared for each contract in accordance with contract requirements including referenced Codes or specifications.

5.1.3 Each WPS shall have substantiating Procedure Qualification Records (PQR) to demonstrate the satisfactory performance of the WPS. Depending upon contract requirements, PQR's may be previously qualified or performed new for the specific contract.

5.2 Procedure Qualifications Records (PQR)

5.2.1 Instructions for the preparation and writing of PQR's is given in CB&I Standard 831-1.

5.2.2 PQR's shall include, as a minimum, the following:

- A. Base materials and welding materials.
- B. Records of all essential and nonessential variables.
- C. Results of mechanical and chemical testing.



5.2.2 (con't)

- D. Results of nondestructive examination.
- E. Certification of PQR by a CB&I Welding Engineer.

5.2.3 When required by the contract, preparation, welding, inspection and testing shall be witnessed by the customer or AI.

6.0 CONTROL OF WELDING:

6.1 Assignment of Welders

The assignment of work to welders is the responsibility of the Superintendent (Foreman) who shall consult with the Welding & QC Supervisor to determine that the welders are qualified to perform the work. Welding & QC Supervisors are responsible for advising the Superintendent (Foreman) when a welder is not qualified or lacks training and experience to the degree that sufficient supervision cannot be given to ensure proper results.

6.2 Welding Activities

- 6.2.1 The Welding & QC Supervisor shall review the WPS and instruct the welder in its use. This instruction may be verbal and/or by demonstration.
- 6.2.2 Welding & QC Supervisors shall monitor welding for compliance with the WPS and perform inspections required by process control documents.
- 6.2.3 Documentation of welding verifications and inspections shall be made on process control documents when required.



6.3 Welder Identification:

6.3.1 For weld joints that require identification of the welder, one of the following methods shall be used:

A) Mark the welders identification number or symbol on or adjacent to and at intervals of not more than 3 feet along the welds they make, or

B) Make a record of the welders used on each joint.

6.3.2 When marking of the joints is used for welder identification, it shall be made with steel stencils, using low stress dies, unless the material is less than 1/4" in thickness (1/2" for nonferrous materials), in which case, paint or ink markers shall be used.

6.3.3 For ASME Work:

A) All pressure boundary joints require welder identification.

B) Permanent nonpressure part attachment welds and/or tack welds that become part of the final pressure boundary weld only require group welder identification. The welders identification may be grouped and listed in a table format on a single process control document, provided the same welding procedure is utilized.

6.4 Welders not in the employ of CB&I may be used to weld components provided all of the following conditions are met:

A) All welders shall be qualified by CB&I per 4.0.

B) All welders shall be assigned a unique identification number or symbol by CB&I.



- C) All welding shall be in accordance with CB&I welding procedures.
- D) All welders shall be completely and exclusively administered and technically supervised by CB&I.
- E) CB&I shall have the authority to assign and remove welders without the involvement of any other organization.

6.5 Tack welds used to secure alignment shall either be removed completely when they have served their purpose, or their stopping and starting ends shall be properly prepared by grinding or other suitable means so that they may be satisfactorily incorporated into the final weld and shall be visually inspected by the Welding & QC Supervisor.

7.0 RECORDS:

- 7.1 WPS's and PQR's are contract records and shall be maintained by the Welding & QC Manager.
- 7.2 Records required by this procedure, other than WPS's and PQR's, are internal records and shall be maintained by the Welding & QC Manager.

8.0 ATTACHMENTS: (Typical)

- 8.1 Attachment 1 - Performance Qualification Test Form
- 8.2 Attachment 2 - Field Receiving Inspection Report for Welding Material



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ATTACHMENT 1

PERFORMANCE QUALIFICATION TEST <small>In Accordance with Section IX of the ASME Code - Latest Edition</small> SHIELDED METAL ARC PROCESS						Record of Utilization		
Material - Spec: _____ to _____ of P No. _____ to P No. _____ Weld Procedure Specification Number (WPS): _____ Filler Metal (F No.) F: _____ Filler Metal (SFA) Specification SFA: _____					Month / Year	Type of Insp.	Initials	
Back gouge to clean metal and weld overhead		This test qualifies all thickness ranges to be welded.	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Result <input type="checkbox"/>				
OVERHEAD - BOTH SIDES								
Back gouge to clean metal and weld horizontal		This test qualifies all thickness ranges to be welded.	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Result <input type="checkbox"/>				
HORIZONTAL - BOTH SIDES								
Back gouge to clean metal and weld vertical		All passes uphill except first pass and wash passes which may be run downhill or uphill. This test qualifies all thickness ranges to be welded.	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Result <input type="checkbox"/>				
VERTICAL - BOTH SIDES								
Back gouge to clean metal and weld vertical		All passes are to be run downhill. This test qualifies range 0" to 3/4"	Test Method 2 Bends per QW-462 Radiography of 6" of test plate Result 1 <input type="checkbox"/> Result 2 <input type="checkbox"/>	Result <input type="checkbox"/>				
3/8" SINGLE BEVEL BUTT VERTICAL								
1. Qualification on butt welds also qualifies welder for fillet welds and butt welds with back-up bars 2. Qualification with F-6 & F-6X electrodes may be made on P-1 test plates. 3. Radiography of a 6" section of plate may be used in lieu of bend test. 4. Qualification with F-4 electrode also qualifies for F-3, F-2, and F-1. 5. Acceptance of test results includes the examination of welded coupon(s) for complete penetration and fusion.								
Date	Location	Social Security No.	Birth Date	Started CBI Year:	Specimen Mark			
WE CERTIFY THAT THE STATEMENTS MADE IN THIS RECORD ARE CORRECT AND THAT THE TEST WELDS WERE PREPARED, WELDED, AND TESTED IN ACCORDANCE WITH SECTION IX OF THE ASME CODE - LATEST EDITION / AND MAINTAINED FROM THE TIME OF TEST TO THIS DATE.						Address: _____ City: _____ State: _____ Full Name: _____ CBI REPRESENTATIVE DATE First Middle Last		X = X-Ray V = Visual R = Renewal

WL 111 (FRONT) REV AUG 93




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PAGE NO. 10 OF 10

ATTACHMENT 2



**FIELD RECEIVING INSPECTION REPORT
FOR WELDING MATERIALS**

Contract Number _____ CBI Order Number _____

Supplier _____ Manufacturer _____

RECEIVING INSPECTION

Quantity Received and Inspected _____

Size and Type _____

Specification _____

Condition of Material _____

Nonconformity: Yes No

 If yes explain: _____

Explain Disposition: _____

Material Meets Requirements of:

Bill Sheet Purchase Order Requisition

Release for Fabrication: _____ Date _____

(Welding & QC Supervisor)

WL 247 REV DEC 88



DOC. ID QAP 10.1
 REV. NO. 8
 CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 1 OF 10

						BY	DATE
	Engr	Corp Weld	Corp QA	Const	Mfg HSB	PREPARED	ALD 12-9-92
	JH			LBR	AGR CMD	REVISED	RWK 1-16-98
APPROVED				JDM	JCV	AUTHORIZED	<i>RWK 2/23/98</i>
				DAD	WJS	REFERENCED	
						STANDARD	--- REV. NO. -
Extensively Revised							

1.0 SCOPE:

This procedure describes the receipt, inspection and release of items from a supplier (see QAP 9.2 for additional requirements for welding materials).

2.0 RESPONSIBILITIES:

- 2.1 Purchasing is responsible for records relating to purchased items including receiving inspection reports (RIRs), supplier documentation and releasing items for use that require an RIR or a preliminary release.
- 2.2 Shop or Field QC may assume Purchasing's responsibilities per this QAP.
- 2.3 Receiving personnel, who report to the Superintendent, are responsible for receipt inspections and releasing items for use that do not require an RIR.
- 2.4 The Welding & QC Manager is responsible for resolving nonconformities and for releasing items that require a nonconforming release.

3.0 PROCEDURE:

3.1 Receipt

- 3.1.1 Purchasing shall send to Receiving a copy of the Purchase Order (PO), if not available electronically, and any sketches or drawings required for receipt.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR PAGE NO. 2 OF 10
ITEMS FROM A SUPPLIER

- 3.1.2 Purchasing shall initiate RIRs (see Attachment 1) and Material Verification Summary Sheets (MVSSs) (see Attachment 2) when required per CB&I Standard 607-3 and send the RIRs to the Receiving location.
- 3.1.3 When operations and tests are required to be performed to make the item acceptable per the material specification and they are to be performed by CB&I after receipt, Purchasing shall note these requirements under the nonconformities section of the RIR.
- 3.1.4 For direct shipments to the field, Purchasing shall send the necessary receiving documents to the Project Manager who shall forward them on to the jobsite.
- 3.1.5 When items are received from a supplier, Receiving personnel shall obtain any documentation supplied with the items.
- 3.1.6 Receiving personnel shall perform receipt inspections immediately upon receipt of an item(s) or shall segregate the item(s) until a receipt inspection can be performed.
- 3.1.7 Receiving personnel shall check to see that they have the required information for the items from Purchasing. This includes the PO, if no electronic access, including any sketches or drawings, and, when required, the RIR.
- 3.2 Inspection and Release of Items from a supplier, when an RIR is not required (See flowchart in 6.1):
 - 3.2.1 Receiving personnel shall check the items for compliance with the PO and any sketches or drawings, that they were not damaged during shipment, and are properly identified.
 - 3.2.1.1 If the items are acceptable, this shall be noted on the PO, shipping documents or electronically and the items released for use.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR PAGE NO. 3 OF 10
ITEMS FROM A SUPPLIER

- 3.2.1.2 If any of the items are unacceptable, the reason shall be noted on the PO, shipping documents or electronically and the items tagged or marked "hold" or placed in a designated hold area.
- 3.2.1.3 All technical documents accompanying the shipment such as Material Test Reports (MTRs), Certificates of Conformance (COCs), etc. shall be forwarded to Purchasing.
- 3.2.1.4 For locations without electronic access, the shipping documents shall be forwarded to Purchasing.
- 3.2.1.5 For direct shipments to the Field, the shipping documents shall be sent to the Project Manager who shall either forward them on to Purchasing or acknowledge the items receipt electronically.
- 3.2.2 Clerical errors in paperwork and marking or identification discrepancies shall be resolved with the supplier by Purchasing.
- 3.2.3 If an item is unacceptable and it is not to be rejected and returned to the supplier, Purchasing shall fill out an RIR on the item and initiate the nonconformities section. The RIR and any applicable documentation shall be forwarded to the Welding & QC Manager for disposition.
- 3.3 Inspection and release of items from a supplier, when an RIR is required (See flowchart in 6.2):
 - 3.3.1 Receiving personnel shall check the items for compliance with the PO and any sketches and drawings, that they were not damaged during shipment, are properly identified and shall perform and document all the checks required by the RIR. See CB&I Standard 607-3-3.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR PAGE NO. 4 OF 10
ITEMS FROM A SUPPLIER

- 3.3.1.1 If the items are acceptable, the completed RIRs shall be forwarded to Purchasing and the items held pending final release.
- 3.3.1.2 If any of the items are unacceptable, the reason shall be noted on the RIR and the item tagged or marked "hold" or placed in a designated hold area. The completed RIRs shall be forwarded to Purchasing for disposition.
- 3.3.1.3 All technical documents accompanying the shipment such as Material Test Reports (MTRs), Certificates of Conformance (COCs), etc. shall be forwarded to Purchasing.
- 3.3.1.4 For direct shipments to the Field, the RIR and any shipping documents shall be sent to the Project Manager who shall forward the RIR on to Purchasing, and either acknowledge the items receipt electronically or also forward the shipping documents.
- 3.3.2 Upon receiving the completed RIRs and any technical documents from Receiving, Purchasing shall release the items for use, by signing the "Material Released for Fabrication" block, if the results of the receipt inspection and the check of the suppliers documentation (Manufacturer's Data Reports, MTRs or COCs (via hardcopy or electronic transfer), NDE reports, etc.) are acceptable. A copy of the released RIR shall be forwarded to Receiving.
- 3.3.3 Clerical errors in paperwork, marking, or identification discrepancies shall be resolved with the supplier by Purchasing.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 5 OF 10

3.3.4 If an item is nonconforming and it is not to be rejected and returned to the supplier, the nonconformities section of the RIR shall be initiated by Purchasing. The RIR and any applicable documentation shall be forwarded to the Welding & QC Manager for disposition.

3.4 Preliminary Release

3.4.1 In special circumstances, i.e., when the item meets the PO requirements but the supplier's documentation or markings are deficient and the item needs to be used, Purchasing may preliminarily release the item provided it is positively identified so that, in the event of a nonconformity, it can be located and held for disposition. See CB&I Standard 607-3-3.

3.4.2 For items to be preliminary released, Purchasing shall indicate a preliminary release in the "Material Released for Fabrication" block. A copy of the RIR shall be sent to Receiving and to the Welding & QC Manager. The Welding & QC Manager shall establish controls to positively identify the item.

3.4.3 When Purchasing resolves the deficient documentation or markings, the final release on the RIR shall be signed and a copy sent to the Welding & QC Manager.

3.5 Nonconforming Release

3.5.1 Nonconforming items may be released by the Welding & QC Manager for use if it is determined that the nonconformity is likely to be resolved, provided the item is positively identified so that it can be located and removed if the nonconformity cannot be resolved. See CB&I Standard 607-3-3.



DOC. ID QAP 10.1
REV. NO. 8
CONTRACT

TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A SUPPLIER PAGE NO. 6 OF 10

3.5.2 For items to be released nonconforming, the Welding & QC Manager shall indicate a nonconforming release in the "Material Released for Fabrication" block. A copy of the RIR shall be sent to Receiving and Purchasing. The Welding & QC Manager shall establish controls to positively identify the item.

3.5.3 When the Welding & QC Manager resolves the nonconformity, the final release on the RIR shall be signed and the RIR sent to Purchasing.

4.0 RECORDS:

Records generated per this procedure are contract records and shall be maintained by Purchasing per CB&I Standard 590-1-4.

5.0 ATTACHMENTS: (Typical)

5.1 Attachment 1 - Receiving Inspection Report

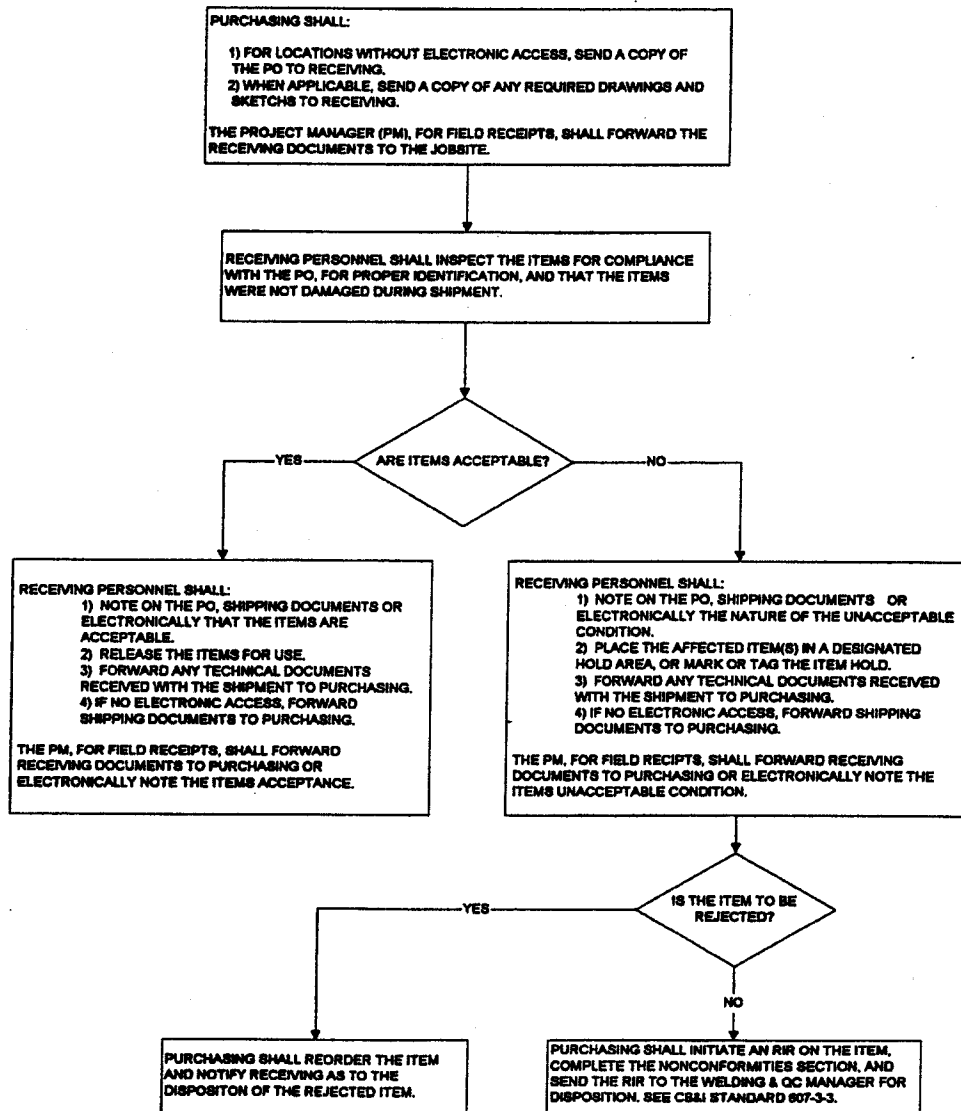
5.2 Attachment 2 - Material Verification Summary Sheet



6.0 FLOWCHARTS:

6.1 Flowchart:

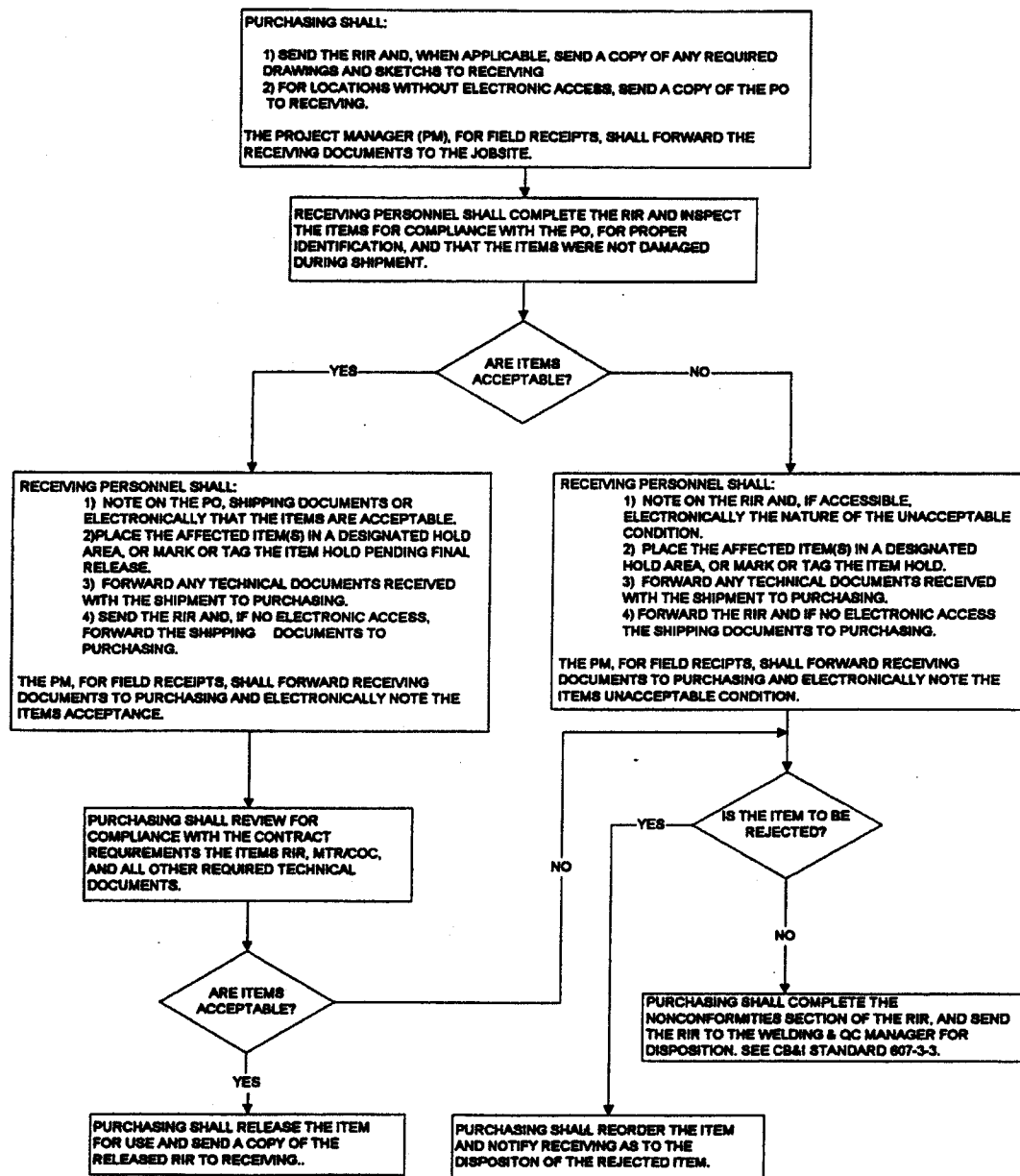
INSPECTION AND RELEASE OF ITEMS FROM A SUPPLIER,
WHEN AN RIR IS NOT REQUIRED





6.2 Flowchart

INSPECTION AND RELEASE OF ITEMS FROM A SUPPLIER,
WHEN AN RIR IS REQUIRED





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TITLE RECEIVING INSPECTION REQUIREMENTS FOR
 ITEMS FROM A SUPPLIER

PAGE NO. 9 OF 10

ATTACHMENT 1

**METAL RECEIVING
 INSPECTION REPORT**

Contract No. _____
 CBI Order No. _____
 Supplier _____
 Ordered Item No. _____ Quan. Ordered _____
 Material Spec. _____
 Description _____
 Initiated By _____ Date _____

ROUTE TO	BY	DATE	FOR

RECEIVING INSPECTION: From Information on Material

Carrier or Car or Truck No. _____ Quantity Received _____
 Quantity Inspected _____ Partial Complete
 Material Spec. (Marked on Material) _____
 Supplier ID No. (Heat, Slab, Lot, Serial, Etc.) _____

Width OK	Yes <input type="checkbox"/>	No <input type="checkbox"/>	See "Nonconformities"
Length OK	Yes <input type="checkbox"/>	No <input type="checkbox"/>	See "Nonconformities"
Size OK	Yes <input type="checkbox"/>	No <input type="checkbox"/>	See "Nonconformities"
Surface OK	Yes <input type="checkbox"/>	No <input type="checkbox"/>	See "Nonconformities"

FOR HEAT TREATED PLATE:

Purchasing to Check (X) Applicable Mill Stamping

<input type="checkbox"/> Mill Heat Treated	Stamped MT	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<input type="checkbox"/> CBI to Heat Treat	Stamped G	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Nonconformities if "Yes", Explain _____ Yes No

Thickness Record or Sketch

x
x
x
x

Material is held for Disposition Yes No
 Reported By _____ Date _____ Ident. No. of Micrometer or Thickness Gage Used _____

NONCONFORMITIES

(For Material as Received)
 Description (By Purchasing) _____

By CBI Before Material Meets the Specification and is Released For Use:

Heat Treatment - Yes <input type="checkbox"/>	MT - Yes <input type="checkbox"/>	UT - Yes <input type="checkbox"/>	PT - Yes <input type="checkbox"/>
No <input type="checkbox"/>	No <input type="checkbox"/>	No <input type="checkbox"/>	No <input type="checkbox"/>

Other: _____
 Processed By _____ Date _____

Disposition (By QC) _____

Approved By _____ Date _____
 QC
 Disposition of Nonconformity Completed By _____ Date _____

MATERIAL RELEASED FOR FABRICATION

Purchasing _____ Date _____

FILE NO.

Printed in USA See Standard 607-3-3 for instructions on using this form GO 589 REV JAN 97



TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A CB&I SHOP PAGE NO. 2 OF 5

3.2 Inspection and Release of Items from a CB&I Shop, when a SRSCl is not required (See flowchart in 5.1):

3.2.1 Receiving personnel shall inspect the items against the packing list to assure that the items are properly identified and were not damaged during shipment.

3.2.2 If the items are acceptable, this shall be noted on the packing list, the items released for use, and the packing list forwarded to the Superintendent (Foreman).

3.2.3 If any of the items are unacceptable, the reason shall be noted on the packing list and the item tagged or marked "hold" or placed in a designated hold area. The packing list shall be forwarded to the Welding & QC Supervisor for the disposition of these conditions.

3.2.4 The Welding & QC Supervisor shall evaluate the items reported condition to determine it's disposition.

A) If the disposition is that the condition is not nonconforming, the Welding & QC Supervisor shall notify the Superintendent (Foreman) as to what methods or procedures may be followed to correct the condition.

B) If the disposition is that the condition is nonconforming, it shall be handled per QAP 13.1.

3.3 Inspection and release of items from a CB&I shop, when a SRSCl is required (See flowchart in 5.2):

3.3.1 Receiving personnel shall inspect the items against the SRSCl to assure that the items are properly identified and were not damaged during shipment.



TITLE RECEIVING INSPECTION REQUIREMENTS FOR ITEMS FROM A CB&I SHOP PAGE NO. 3 OF 5

- 3.3.2 If the items are acceptable, the "Receiving Shop or Field" column of the SRSCL is signed off, the items released for use, and the SRSCL forwarded, as applicable, to the Shop Welding & QC Manager or Field Welding & QC Supervisor.
- 3.3.3 If any of the items are unacceptable, the reason shall be noted on the SRSCL and the item tagged or marked "hold" or placed in a designated hold area. The SRSCL shall be forwarded to the Welding & QC Manager for the disposition of these items.
- 3.3.4 The Welding & QC Manager shall evaluate the items reported condition to determine it's disposition.
 - A) If the disposition is that the condition is not nonconforming, the Welding & QC Manager shall notify the Welding & QC Supervisor and Superintendent (Foreman) as to what methods or procedures may be followed to correct the condition.
 - B) If the disposition is that the condition is nonconforming, it shall be handled per QAP 13.1.
 - C) For ASME work, shipping damage, identification discrepancies, or deficiencies shall be considered nonconformities. See QAP 13.1.

4.0 RECORDS:

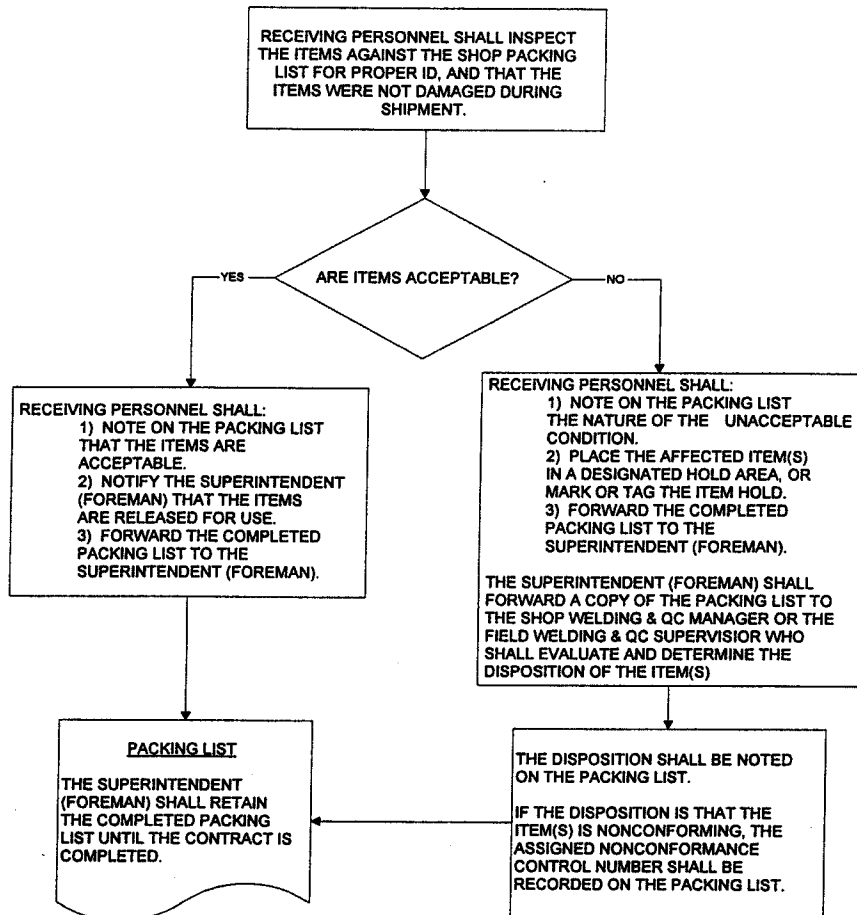
- 4.1 The Superintendent (Foreman) shall maintain the Packing Lists until the completion of the contract.
- 4.2 The Shop Welding & QC Manager or Field Welding & QC Supervisor shall maintain the SRSCLs until the completion of the contract.



5.0 FLOWCHARTS:

5.1 Flowchart

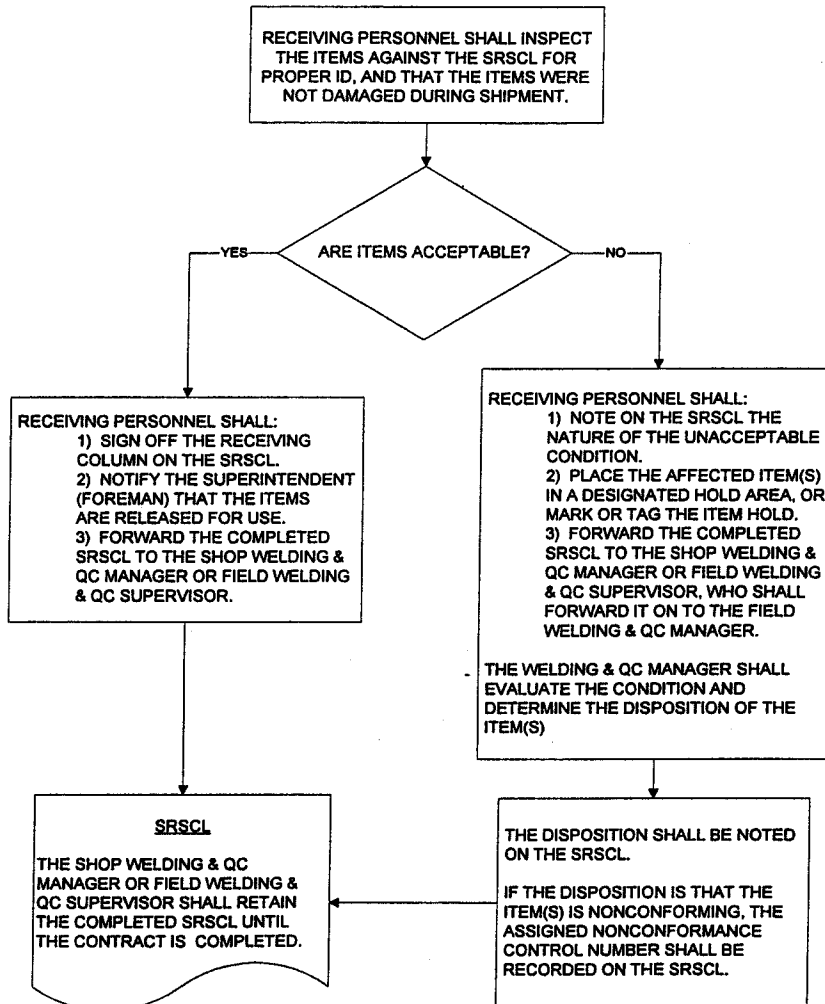
INSPECTION AND RELEASE OF ITEMS FROM A CB&I SHOP,
WHEN A SRSL IS NOT REQUIRED





5.2 Flowchart

INSPECTION AND RELEASE OF ITEMS FROM A CB&I SHOP,
WHEN A SRSCl IS REQUIRED





DOC. ID QAP 15.1
 REV. NO. 5
 CONTRACT

TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY PAGE NO. 1 OF 7

	Engr	Corp Weld	Corp QA	Const	Mfg	HSB	BY	DATE
				JDM	AGR	CMD	PREPARED	REK 8-19-92
				LBR	WJS		REVISED	RWK 1-15-98
APPROVED				DAD			AUTHORIZED	RWK 2/23/98
							REFERENCED	
							STANDARD	REV. NO.

Extensively Revised

1.0 SCOPE:

This procedure describes the handling, storage, preservation and shipment (delivery) of materials and items. The storage and preservation of welding materials shall be per QAP 9.2.

2.0 RESPONSIBILITIES:

2.1 The Superintendent (Foreman) is responsible for the proper handling, storage, packaging, preservation, and shipment of materials and items. Standard handling, storage, packaging, preservation, and shipping requirements are the responsibility of each shop and construction organization and includes CB&I standards, procedures, and verbal instructions.

2.2 The Project Manager or Construction Supervisor is responsible for the preparation, when required, of any special contract procedures and/or instructions necessary to cover any specialized handling, storage, packaging, preservation, or shipping requirements.

2.3 The Welding & QC Manager is responsible for releasing items for shipment that require a Shop Release for Shipment Checklist (SRSCl).

3.0 HANDLING:

3.1 Material and items shall be safely handled and protected using pallets, containers, conveyers, cranes, hoists, vehicles or any other methods as required to prevent damage or deterioration.

3.2 Equipment and devices shall be inspected for proper operation and cleanliness as appropriate to avoid damage or contamination to the products.



TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY PAGE NO. 2 OF 7

3.3 Operator qualifications are controlled by the Superintendent (Foreman). When operators of handling equipment are required to be qualified, copies of their qualifications shall be maintained onsite until the completion of the work.

4.0 STORAGE:

4.1 All material shall be properly stored and/or segregated in designated areas or stockrooms to prevent damage or deterioration from the weather or nearby operations.

4.1.1 Storage may be in enclosed areas or outdoors depending upon the nature of the item (e.g., size, shape, weight, material, duration of storage, etc.).

4.1.2 Stockrooms and special storage containers shall be kept locked if necessary.

4.2 The receipt and dispatch of materials to and from storage areas shall be performed by assigned personnel.

5.0 PACKAGING AND PRESERVATION:

5.1 All materials requiring packaging shall be suitably packaged to avoid damage or deterioration during storage or shipment.

5.2 Any special methods for cleaning, packing and preservation including the details for moisture elimination, cushioning, blocking and crating shall be performed in accordance with written procedures and/or instructions.

5.3 All packaging shall be marked to maintain identification of contents.

6.0 SHIPMENT:

6.1 All materials and items shall be suitably protected to avoid damage or deterioration during shipment.

6.2 Procedures and/or instructions including sketches showing packing and loading arrangements, location of tie downs and any required exterior protection shall be prepared, as needed, to prevent damage or loss of materials and items during shipment.



TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION PAGE NO. 3 OF 7
AND DELIVERY

- 6.3 The Superintendent (Foreman) shall inspect material and items, against the applicable drawings, requisitions, process control documents, etc. to assure the material and items are in conformance and that all required inspections and tests are completed and acceptable. For material and items that are acceptable, the Superintendent (Foreman) shall prepare a delivery/packing list (See attachment 1).
- 6.4 For material and items that do not require a SRSCL, the Superintendent (Foreman) shall release the material and items for shipment. The Superintendent (Foreman) shall send copies of the delivery/packing list with the shipment and to the Project Manager.
- 6.5 For material and items requiring a SRSCL (See attachment 2), the Welding & QC Manager shall release the material and items for shipment. The Superintendent (Foreman) shall notify the Welding & QC Manager when material and items that require a SRSCL are ready for shipment.
- 6.6 The Welding & QC Manager shall initiate a SRSCL and inspect all material and items required to be listed on a SRSCL to ensure they have been manufactured and documented per the applicable code, customer, CB&I, and QAM requirements. See CB&I Standard 607-3-3.
- 6.6.1 For ASME work, the SRSCL shall be presented to the AI for the AI's concurrence that the listed material and items are in compliance with Code requirements and released for shipment. The AI's signature on the SRSCL indicates to the AI in the field that the Material Test Reports or Certificates of Compliance have been reviewed and welded assemblies are in compliance with the code.
- 6.6.2 When required, the SRSCL, shall be presented to the customer for concurrence that the listed material and items are in compliance with contract requirements and released for shipment.



TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION PAGE NO. 4 OF 7
AND DELIVERY

6.7 The Welding & QC Manager shall send the original SRSCl to the Field Welding & QC Manager and a copy to the Superintendent (Foreman) releasing the material and items for shipment. The Superintendent (Foreman) shall send a copy of the delivery/packing list and SRSCl along with the shipment.

6.8 For ASME work, items originally planned to be shop assembled may be field assembled and vice versa without revising the drawings or requisitions, if agreed to by the Project Manager, Engineering-Assigned, and the Manufacturing and Construction Welding & QC Managers. Such agreements shall be noted on the SRSCl and in these cases a copy of the SRSCl shall be sent to the Project Manager and the Construction Welding & QC Manager.

7.0 MONITORING:

When material and items are expected to be stored for extended periods of time, the Superintendent (Foreman) shall perform periodic checks on the stored items to ensure they are being stored in accordance with the applicable instructions.

8.0 DAMAGE OR DETERIORATION:

Damaged or deteriorated material and items shall be reported to the Superintendent (Foreman) for disposition. If the Superintendent (Foreman) decides the material or item is not to be rejected and it cannot be repaired or reworked per an existing approved procedure, the Welding & QC Manager shall be notified for the disposition.

9.0 RECORDS:

9.1 The Superintendent (Foreman) shall maintain copies of the Delivery/Packing Lists until the completion of the contract.

9.2 The Shop Welding & QC Manager or Field Welding & QC Supervisor shall maintain the SRSCls until the completion of the contract.



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TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY PAGE NO. 5 OF 7

9.3 Contract procedures and instructions generated per this QAP are contract records and shall be maintained by the Superintendent (Foreman) until the completion of the contract.

10.0 ATTACHMENTS (Typical):

10.1 Attachment 1 - Packing List

10.2 Attachment 2 - Shop Release for Shipment Checklist



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 REV. NO. 5
 CONTRACT

TITLE HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY PAGE NO. 7 OF 7

ATTACHMENT 2

CBI SHOP RELEASE FOR SHIPMENT CHECK LIST

NO. PCS	PIECE MARK	HEAT SERIAL CODE	ITEM CLASS LEVEL	THESE COLUMNS FILLED IN AT OPTION OF SHIPPING LOCATION			SHIPPING		RECEIVING	
				B.S. LINE NO.	DESCRIPTION	WEIGHT	INSPECTED BY	DATE	INSPECTED BY	DATE
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

NOTES: (Precede notes with "S" for shipping location or "R" for receiving location to indicate originator of note)

TO THE BEST OF MY KNOWLEDGE, THE LISTED ITEMS HAVE BEEN MANUFACTURED AND DOCUMENTED ACCORDING TO THE APPLICABLE CBI QUALITY ASSURANCE MANUAL AND MEET APPLICABLE CODE AND CUSTOMER REQUIREMENTS, EXCEPT AS NOTED

CBI SHOP QC/QA _____ DATE _____

REVIEWED: CUSTOMER INSPECTOR _____ DATE _____

REVIEWED (FOR CODE COMPLIANCE): AWANI (Shop) _____ DATE _____

MADE BY _____ APPD BY _____ DATE _____

RE APPD DATE _____

BY APPD DATE _____

SHIPMENT NO. _____ CONTRACT NO. _____

SH ___ OF ___

60 081 REV JAN 85



DOC. ID QAP 16.2
 REV. NO. 3
 CONTRACT

TITLE QUALITY RECORDS FOR ASME
 AND NBIC WORK

PAGE NO. 1 OF 2

APPROVED	Engr	Corp	Corp	Const	Mfg	HSB	BY	DATE
		Weld	QA					
	JH			LBR	AGR	CMD	PREPARED	REK 10-10-95
				JDM	JCV		REVISED	RWK 1-29-98
				DAD			AUTHORIZED	<i>RWK 2/26/98</i>
							REFERENCED	
							STANDARD	--- REV. NO. -

Extensively Revised

1.0 SCOPE:

This procedure describes the accumulation, control, retention and protection of completed quality records for ASME and NBIC work. Except as modified herein, these requirements are in addition to QAP 16.1.

2.0 GENERAL:

2.1 The following code records shall be retained indefinitely by Engineering-Assigned:

1. Manufacturer's Data Reports/Partial Data Reports or National Board Registration forms.
2. Supplier Partial Data Reports, if applicable.
3. Design Reports for Section VIII, Division 2 Products.
4. User's Design Specification for Section VIII, Division 2 Products
5. Manufacturing Procedures (NDE, Welding, PWHT and Pressure Test) for Section VIII Division 2 Products.
6. Material Certification Records (MTRs & COCs) and Material Verification Summary Sheets (MVSSs) for Section VIII, Division 2 Products.
7. Material Specifications (MSs) for Section VIII, Division 2 Products.
8. Material Repair Records for Section VIII, Division 2 Products.
9. Drawings for Section VIII, Division 2 Products.

2.2 Radiographs for Section I Products shall be retained for five years by the assigned Welding & QC Manager.



TITLE QUALITY RECORDS FOR ASME
AND NBIC WORK

PAGE NO. 2 OF 2

- 2.3 All other quality records not listed above shall be retained or transmitted to the responsible party for retention as required by CB&I Standard 590-1-4.
- 2.4 When transmitting any required quality records to Engineering-Assigned for retention, the Responsible Manager shall place the records in folders and list them on an index or cover letter specifying the folders and types of records included.
- 3.0 RESPONSIBILITIES FOR THE COLLECTION, PROTECTION AND MAINTENANCE OF QUALITY RECORDS:
- 3.1 Purchasing is responsible for Purchasing and Supplier quality records.
- 3.2 The Shop Welding & QC Manager is responsible for the shop quality records.
- 3.3 The Field Welding & QC Supervisor is responsible for the jobsite quality records until the completion of the contract and then for transmitting them to the Construction Welding & QC Manager.
- 3.4 The Construction Welding & QC Manager is responsible for the jobsite quality records.
- 3.5 Engineering-Assigned is responsible for Engineering quality records.
- 4.0 ASSEMBLY AND TRANSMITTAL OF QUALITY RECORDS TO THE PURCHASER:
- When the Purchaser requires copies of quality records, Engineering-Assigned is responsible for assembling them into a Pressure Vessel Booklet (PVB) and transmitting the completed PVB to the Purchaser.



DOC. ID QAP 18.2
 REV. NO. 3
 CONTRACT

TITLE TRAINING AND QUALIFICATION REQUIREMENTS OF PERSONNEL PAGE NO. 1 OF 6

	Engr	Corp	Corp	Const	Mfg		BY	DATE
		Weld	QA				PREPARED	RAJ
APPROVED				LBR	AGR	REVISED	RWK	3-2-98
				JDM		AUTHORIZED	<i>RWK</i>	<i>3/16/98</i>
						REFERENCED		
						STANDARD	---	REV. NO. -

1.0 SCOPE:

This procedure contains the training and qualification requirements for individuals that effect quality. This procedure is not applicable to personnel trained and qualified in accordance with an approved specific organizational procedure per QAP 18.1.

2.0 RESPONSIBILITIES:

Managers are responsible to provide individuals in their organization with the necessary training and experience to properly perform their duties, provide any required certifications and maintain qualification, training and, if required, certification records.

3.0 PROCEDURE:

3.1 Individuals shall be trained and have sufficient experience to properly perform the duties of their position. Trainees may perform the duties of a position, so long as they are supervised by an individual qualified for the position.

3.2 Individuals shall be trained in the Quality Management System (QMS) requirements, including subsequent revisions related to their duties and assignments. This training shall include familiarization with the QAM, QAPs and CB&I Standards (referenced by QAPs) applicable to their position. See Attachment 1 for minimum QMS training requirements.

3.3 Individuals requiring external certifications, such as State Professional Engineer (PE) licenses, NRC or State Industrial Radiographer Certification, AWS Certified Welding Inspectors (CWI) certifications, NACE certification, etc., shall be certified.



TITLE TRAINING AND QUALIFICATION REQUIREMENTS PAGE NO. 2 OF 6
OF PERSONNEL

3.4 Process qualification and training:

3.4.1 Welders shall be qualified and certified and records maintained per QAP 9.2.

3.4.2 NDE technicians shall be trained, qualified and certified and records maintained per QAP 10.2.

4.0 RECORDS:

4.1 Position (3.1) qualification and training records:

4.1.1 Managers shall maintain the following:

4.1.1.1 A listing, by position, of any education, training and/or experience requirements determined to be necessary for a specific position.

4.1.1.2 A listing, by individual, of any identified training needs.

4.1.1.3 A signed and dated organization chart of the qualified individuals in their organization by position. The chart shall show the organization's reporting structure and the qualified individuals for the positions shown. See Attachment 2 for an example.

4.1.1.4 Individual training records shall be maintained for those positions identified in 4.1.1.1 above.

4.2 QMS (3.2) training records:

4.2.1 Training in the QAM, QAPs and applicable CB&I Standards shall be documented. The record(s) of required training shall contain as a minimum:

- Subjects covered during the training session
- Individuals name(s) in attendance
- Date of training session
- Name and signature of individual conducting the session



TITLE	TRAINING AND QUALIFICATION REQUIREMENTS OF PERSONNEL	PAGE NO.	3	OF	6
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4.2.1 (continued)

See Attachment 3 for an example for a training record.

4.2.2 Training records may be grouped or filed by individual.

4.2.3 Managers shall maintain a signed and dated training matrix that references the current QAM and QAP index revision level documenting the completion of training of individuals in their organization. See Attachment 1 for an example.

4.3 Certification (3.3) records

4.3.1 Managers shall maintain on file the required external certifications of individuals in their organizations.

4.3.2 Certification records may be grouped or filed by individual.

5.0 ATTACHMENTS:

5.1 Attachment 1 - QMS Training Matrix

5.2 Attachment 2 - Typical Organization Chart

5.3 Attachment 3 - Typical Record of Training or Indoctri-
nation Activity



ATTACHMENT 2
TYPICAL ORGANIZATION CHART

