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BRUNSWICK STEAM ELECTRIC PLANT

PHASE II WALKDOWN PROCEDURE

PROCEDURE NO. WDP-002

TITLE: PHASE II WALKDOWN PROCEDURE FOR REACTOR BUILDING MISCELLANEOUS STEEL AND DRYWELL PLATFORM STEEL

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BRUNSWICK STEAM ELECTRIC PLANT

PHASE II WALKDOWN PROCEDURE FOR REACTOR BUILDING MISCELLANEOUS STEEL AND DRYWELL PLATFORM STEEL

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Appendix A - Welding Verification Guidelines

1.0 PURPOSE

This Phase II walkdown procedure (WDP-002) establishes the methods for conducting and documenting the walkdowns for the Reactor Building Miscellaneous Steel and Drywell Platform Steel Verification Program for Brunswick Steam Electric Plant, Units 1 and 2. The primary objective of the walkdowns is to identify and record existing irregularities and to collect sufficient data to permit engineering evaluations for verification of adequacy of the related miscellaneous and platform steel. A second objective is to obtain data which could assist in the updating of the best available design documents to reflect the field conditions. This WDP-002 will be used to perform the following tasks:

1.1 Identify and record significant differences between field conditions and the existing design documents of miscellaneous steel and drywell structural steel members (e.g., member sizes, orientation, location, additional members not shown on drawings, missing members, etc.).

1.2 Identify and record significant differences between field conditions and the existing design documents for the connection details.

1.3 Identify and record significant differences between field conditions and the existing design documents for accessible portions of embeds and surface-mounted plates within the influence zone of attached miscellaneous steel or drywell steel.

1.4 Determine the location and type of major attachments to miscellaneous steel and drywell structural steel members which will be used to establish applied loadings for analysis.

1.5 Identify and record any damage or other irregularities that may require engineering evaluation.

High resolution, scaled photographs of the connections, embeds, and surface-mounted plates may be used extensively to assist in the identification and determination of details required for verification of miscellaneous and drywell platform steel.

2.0 BACKGROUND

Physical irregularities have been noted in the miscellaneous steel and connections in the Reactor Building of the Carolina Power and Light (CP&L) Brunswick Steam Electric

Plant Units 1 and 2. CP&L personnel familiar with the irregularities indicate that some of these irregularities are associated with the initial erection of the steel. Others may have occurred since the initial installation.

3.0 SCOPE

The scope of this procedure includes verification of the miscellaneous and drywell platform steel in Units 1 and 2 and identification and recording of any significant irregularities. This work will be accomplished by field walkdown of the miscellaneous steel, recording of irregularities that need to be addressed, and taking measurements to verify compliance with design documents. Only those characteristics that are necessary for engineering evaluation will be measured and recorded. Details that are not necessary for engineering evaluations need not be recorded; the exhibits attached as an integral part of this WDP-002 are designed to be consistent with this philosophy. The characteristics of various structural elements that need to be verified and recorded are discussed in Section 11.0. The specific scope of work is as follows:

3.1 Identification of members and connections presently shown on the design drawings by a unique number. Since the location and scope of each member may not be defined on available drawings, it will be necessary for the walkdown teams to assign an identifying mark number for each additional member in the program. These mark numbers will be a continuation of the developed numbering system described in Section 7.0.

3.2 Members and connections that have been installed in accordance with the design drawings can be evaluated using the drawing data and specific measurements need not be taken. In order to identify the cases with irregularities, walkdowns may be preceded by collection of high resolution 35 mm photographs. Review of these photos by an experienced engineering team (including welding engineers) will determine those structural items and welding details that require collection of data as outlined in this procedure. This philosophy also serves ALARA principles in relatively higher radiation areas since time spent inside the reactor building is minimized.

Cameras with telephoto capabilities and compatible lighting systems will be used where appropriate to minimize the need for scaffolding.

3.3 Platforms inside the Units 1 and 2 drywell located at Els 17'-10 1/4", 38'-7 1/4", 52'-5 1/4", 67'-2 1/2", and 80'-2 1/2".

3.4 Miscellaneous steel in Units 1 and 2 reactor buildings are located at various elevations between floor at El (-)17'-4" & 20'-0", El 20'-0" and 50'-0", El 50'-0" and 80'-0", and El 80'-0" and 117'-4". The miscellaneous steel may be attached to embedded plates or supported by columns anchored to base plates. The scope of the reactor building miscellaneous steel includes those items listed below:

3.4.1 Reactor Building, Unit 1, miscellaneous steel between El (-) 17'-4" and El 20'-0" (Drawing Numbers: 9527-F-12023, 9527-F-12024, 9527-F-12025, 9527-F-12026)

3.4.2 Reactor Building, Unit 1, miscellaneous steel between El 20'-0" and El 50'-0" (Drawing Numbers: 9527-F-18050, 9527-F-18051, 9527-F-18052, 9527-F-11020, 9527-F-11021, and 9527-F-11023)

3.4.3 Reactor Building, Unit 1, miscellaneous steel between El 50'-0" and El 80'-0" (Drawing Numbers: 9527-F-18053, 9527-F-18054, 9527-F-18067, 9527-D-81043, 9527-F-11047, 9527-F-12053, 9527-F-1104D, and 9527-F-11041)

3.4.4 Reactor Building, Unit 1, miscellaneous steel between El 80'-0" and EL 117'-4" (Drawing Numbers: 9527-F-18056, 9527-F-18057, 9527-F-18058, 9527-F-11045, 9527-F-11048, 9527-F-11049, and 9527-F-11052)

3.4.5 Reactor Building, Unit 2, miscellaneous steel between El (-) 17'-4" and El 20'-0" (Drawing Numbers: 9527-F-01223, 9527-F-01224, 9527-F-01225, and 9527-F-01226)

3.4.6 Reactor Building, Unit 2, miscellaneous steel between El 20'-0" and El 50'-0" (Drawing Numbers: 9527-F-01850, 9527-F-01851, 9527-F-01852, 9527-F-01859, 9527-F-01120, 9527-F-01121, and 9527-F-01123)

3.4.7 Reactor Building, Unit 2, miscellaneous steel between El 50'-0" and El 80'-0" (Drawing Numbers: 9527-F-01853, 9527-F-01854, 9527-F-01855, 9527-F-01867, 9527-F-01900, 9527-F-1147, 9527-F-1253, 9527-F-01140, and 9527-F-01141)

3.4.8 Reactor Building, Unit 2, miscellaneous steel between El 80'-0" and El 117'4" (Drawing Numbers: 9527-F-01856, 9527-F-01857, 9527-F-

01858, 9527-F-1862, 9527-F-1145, 9527-F-1148, 9527-F-1149, and 9527-F-1152)

3.4.9 Unit 1, CRD System, Reactor Building, seismic support for HCU banks - El 20'-0" - South Bank (Drawing No. D-83086)

3.4.10 Unit 1, CRD System, Reactor Building, seismic support for HCU banks - El 20'-0" - North Bank (Drawing No. D-83087)

3.4.11 Unit 2, CRD System, Reactor Building, seismic support for HCU banks - El 20'-0" - South Bank (Drawing No. 9527-D-08386)

3.4.12 Unit 2, CRD System, Reactor Building, seismic support for HCU banks - El 20'-0" - North Bank (Drawing No. 9527-D-08387)

3.5 The scope also includes additional secondary steel members which were added to support pipe, HVAC, and electrical commodity supports not shown on CP&L drawings and not generally included as part of the commodity support.

3.6 IEB 79-14 pipe supports have been previously located by CP&L in walkdown packages of those supports. The attachment locations of these supports for pipe 4 inches and larger in diameter as identified on CP&L walkdown data are to be redefined with respect to the miscellaneous steel and transcribed to the walkdown packages.

3.7 CP&L had previously walked down 9 areas in the reactor building outside the drywell in 1990 and 1991 to determine adequacy of the miscellaneous steel. Two of those areas will be randomly checked for accuracy. If it is confirmed that this data adequately reflects the actual conditions, using the guidelines required by this procedure, the remainder of the CP&L walkdown data will be accepted as part of this walkdown, subject to the verification included in Section 9.2. If discrepancies exist between the CP&L data and actual conditions, using measurement of this document, all 9 areas will be included in this program.

3.8 Verification of accessible portions of embedded and surface-mounted plates, as they affect the potential load carrying capacity of the subject steel, is part of the scope of this activity. Specific attributes are identified in Section 11.0.

3.9 Information to identify loads from major attachments is to be collected by field measurement. The requirements for this activity are included in Section 11.0.

Procedures for identifying loads on members from other than major attachments are also included in Section 11.0

3.10 The scope of this walkdown is limited to accessible areas. It is anticipated that the inaccessible items will generally be limited to embeds and surface mounted plates. Miscellaneous steel in inaccessible areas will be addressed on a case-by-case basis.

3.11 Items not included in the walkdown, except as noted above:

- Pipe Support Steel
- Reactor Building Structural Steel above the Refueling Floor
- Conduit Support Steel
- Cable Tray Support Steel
- HVAC Support Steel
- Instrument Tubing Support Steel
- Pipe Whip Restraint Structural Steel
- Reactor Vessel and Sacrificial Shield Stabilizer Steel
- Stairs, Ladders, and personnel access platforms
- Structural Steel for Equipment Hatch Removal
- Inaccessible Portions of Connections, Members, and Embeds

4.0 DEFINITIONS

Best Available Design Information:

A collection of existing calculations and design, fabrication and erection drawings, and modification documentation, that identifies the design, fabrication, and erection details for the subject steel.

Drywell Platforms:

The platforms at El 17'-10 1/4", El 38'-5 1/4", El 52'-7 1/4", El 67'-2 1/2", and El. 80'-2 1/2" located inside the drywell of Units 1 and 2 and the vertical members (not pipe whip restraints) that connect the horizontal platforms.

Irregularities:

Items such as welds, bolts, attachment angles, members, etc. or structural configurations (a series of items combined to form a specific structural function) that are not generally in accordance with the best available design information and/or accepted standard practice. Standard practice is defined as practices similar or comparable to those recommended by the American Institute of Steel Construction (AISC) Specifications for Buildings. Significant irregularities are those that may affect load-carrying capability of structural components.

Influence Zone

Term used to define the area adjacent to an embed or surface mounted plate. Other embeds or attachments within this zone may influence the load capacity of the embed being reviewed.

Major Attachments:

Attachments to beams for IEB 79-14 piping four inches or larger, Non-79-14 piping larger than 10 inches nominal diameter, cable trays with more than 4 tiers and any other attachment with relatively large loads.

Project Walkdown Supervisor:

The person responsible for conducting the walkdown program in accordance with the approved procedures. He is responsible for verifying the training of all walkdown personnel, for ensuring that walkdown packages are assembled and that the pre-walkdown review of best available design information is performed by the walkdown teams. He also coordinates the activities of the walkdown teams, maintains their status, and ensures that the walkdown products are complete and acceptable.

Reactor Building Miscellaneous Steel:

The miscellaneous steel inside the reactor building consisting of primarily horizontal, but with some vertical (columns) and bracing members, that may be attached to embed plates, surface-mounted plates, or other structural steel in the ceiling or on the floors between various floor elevations.

79-14 Piping:

Piping included within the scope of the IE Bulletin 79-14 program.

5.0 PERSONNEL QUALIFICATION REQUIREMENTS AND TRAINING

5.1 Personnel Qualifications

Personnel conducting data collection walkdowns shall have previous experience in walkdowns, or physical design/construction experience with structural steel. Personnel conducting weld verification walkdowns shall be welding engineers and have previous experience with making/repairing/verifying the welds.

5.2 Training

Personnel performing a walkdown or an independent review of walkdown activities shall have received the following indoctrination and training prior to conducting the walkdown.

5.2.1 Indoctrination training on the Bechtel Quality Assurance Program and an explanation of the EDP system, as required by EDP 5.34 (Reference 1), and training in appropriate EDPs as determined by the Walkdown Group Supervisor and Engineering Assurance.

5.2.2 Training in this procedure (WDP-002).

5.2.3 Training will include plant orientation addressing physical plant layout and applicable CP&L procedures, specifications, etc. including the following:

- Plant General Arrangement Drawings
- Specification No. 248-107 (Reference 2) Installation of Seismic Pipe and HVAC Supports and Miscellaneous Steel
- The Administration of the Automated Maintenance Management System, AI-79 (Reference 3)
- Instructions for Working in Hot Environments, AI-107 (Reference 4)

- BSEP Field Engineering Inspection (As-Building), NED Guideline E-9, Rev. 0 (Reference 5) (Information only)

- Specification No. 018-002, Specification for Furnishing and Installation of Miscellaneous Iron and Steel (Reference 6)

- Specification No. 9527-01-12-2, Specification for Sacrificial Shield and Dryweli Interior Structural Steel (Reference 7)

5.2.4 Welding engineers involved in walkdown shall be trained in Visual Weld Acceptance Criteria (VWAC) methodology.

5.3 Training Methodology and Documentation

Training methodology may consist of classroom sessions, required reading, audio/video presentation(s), or any combination of these methodologies. Scheduling, conducting training sessions, and documentation of training is the responsibility of the Project Walkdown Supervisor.

The above training shall be documented in accordance with EDP 5.34.

5.4 Additional Training

In addition to the above training, the Walkdown Team personnel shall be given the following training prior to conducting engineering walkdowns:

- General yemployee training (CP&L)
- Respirator training, as required (CP&L)
- ALARA training (CP&L)
- Safety training

5.5 Qualification and Training Records

Training records shall be maintained in accordance with EDP 5.34 with the exception that Engineering Assurance will maintain a copy of training records including copies of resumés on site.

6.0 PRECAUTIONS/LIMITATIONS/ALARA

6.1 Precautions/Limitations

6.1.1 Personnel shall at all times adhere to the established site standards and procedures for personnel/public safety as well as take necessary precautionary measures to prevent damage to plant equipment. Personnel shall obey all Plant Procedures and requirements such as Safety, ALARA, Health Physics, Hold Order Tags, Caution Signs, etc., that are posted on plant equipment. If tag removal is deemed necessary to complete the task, it shall be coordinated through CP&L Field Services and Operations in accordance with existing Plant Procedures.

6.1.2 Personnel will be working in close proximity to components that affect the safe operation and shutdown of the plant. They shall be aware that inadvertent actuation of plant safety systems is of significant concern to CP&L in terms of site operations and potential impact on the health and safety of the general public. Care shall be taken in all aspects of in-plant activities.

6.1.3 Walkdown activities shall be coordinated with the Outage Coordinator-Planning and Scheduling Unit prior to performing in-plant activities.

6.1.4 Personnel shall notify the CP&L Project Manager and Bechtel Project Walkdown Supervisor, PE, or PEM immediately when an event or condition potentially reportable to the NRC, a safety hazard, or equipment malfunction is identified.

6.1.5 Personnel shall exercise extreme caution when working around rotating, moving, or energized equipment and should be aware of the possibility of equipment automatically starting.

6.2 ALARA

An ALARA pre-plan shall be coordinated with CP&L Health Physics prior to walkdown in order to achieve radiation exposure ALARA. Personnel shall work closely with Health Physics during all phases of the work in radiologically-controlled areas. If conditions in the work area change significantly, personnel

shall leave the area immediately and notify Health Physics and the SOS or Unit Operator.

7.0 WALKDOWN PACKAGES

7.1 Identification of Walkdown Areas and Items

7.1.1 Reactor Building, outside the Drywell

Walkdown packages shall be separated by unit and structure. The Reactor Building for each unit shall be divided into quadrants based on column lines and shall be identified as shown in "Walkdown Area Designator" sketch (Exhibit D).

The Reactor Building walkdown packages shall also be sectionalized with respect to elevation and column line designations and shall be sized with regard to complexity and "ALARA" considerations.

The structural steel members shall be identified sequentially within a given section moving in north-to-south, west-to-east direction and designations shall be, but not limited to, the following:

(To be used as guideline only)

Columns	CL
Beams	B
Bracing (vertical & horizontal)	BR
Knee brace	KBR
Platform hanger	H
Post	P
Monorail	M

Identification of end connections for horizontal type members shall be with "A" and "B," with "A" being the north or west connection and "B" being the south or east connection where possible. Vertical or inclined members (columns, posts, knee braces, or vertical braces) shall have their bottom as "A" and if required, their top connection as "B" (see Exhibit E).

Accessible portions of all embeds associated with an evaluated end connection shall be considered as part of that particular connection.

7.1.2 Drywell Platforms

Walkdown areas in the drywell will consist of platforms at Elevations 17'-10¼", 38'-5¼", 52'-5¼", 67'-2½", and 80'-2½". The corresponding walkdown packages should be sectionalized "wedges" defined by radial beam members. Radial beams shall be numbered sequentially in a clockwise direction beginning with "R1." The identification of the end connections for the radial beams shall be "A" and "B," and noted as "R1A" and "R1B," and shall include only that part which occurs within the azimuth boundaries of the "wedge." "R1A" would be the connection at the outer drywell wall end and "R1B" would be the connection at the sacrificial shield wall end.

The intermediate structural steel members should in general be identified sequentially within a given "wedge" only and member designations should be similar to those in Section 7.1.1, with the addition of R for radial beams.

The identification of the end connections for intermediate structural members shall be "A" and "B" (e.g., B1A, B1B, or BR1A, BR1B, etc.) and, as a general rule, should be in a clockwise direction or outside to inside direction where possible.

Once a "wedge" is completed, the sequence shall restart with the next "wedge." Each "wedge" section will constitute a walkdown package and each package shall be uniquely identified (see "Package Identification," Section 7.2).

All accessible embeds associated with the end connections shall be considered as part of that particular connection.

7.2 Package Identification

7.2.1 Package identification numbers for the Reactor Building outside the drywell shall include the following:

Unit No.
Building
Walkdown Area Designator (Exhibit D)
Elevation
Column Line Boundaries

Example: 1 - RB - B - EL 20'-0" - (A-B / 2R-3R)
Unit Bldg WD Area Designator | Platform Elevation | West/East North/South Col Boundaries

7.2.2 Package identification numbers for the Drywell Platform Steel shall include the following:

Unit No.
Building
Walkdown Area Designator (Exhibit D)
Elevation
Azimuth Boundaries

Example: 2 - DW - E - EL 38'5¼" - (82°-98°)
Unit Bldg WD Area Designator | Platform Elevation | Azimuth Boundaries of "Wedge"

7.2.3 All package identification numbers shall be accompanied by a CP&L BSEP reference drawing number and revision from which the package was prepared.

Example: Package No: 2-DW-E-EL 38'-5¼" - (82°-98°)
Ref. Dwg No: F-01902 SH. 1 Rev. 0

7.2.4 Any sections, elevations, or details required to clearly identify member connections shall be included in the package and labeled with the same package number and reference drawing number.

7.3 Walkdown Package Content

Each walkdown package shall include, but not be limited to, the following:

1. Walkdown Package Cover Sheet (Exhibit A), completed through blocks 1 to 9

2. Walkdown Package Index Sheet (Exhibit B) with completed applicable entries.

3. Walkdown Drawing List (Exhibit C)

4. A copy of the Area Designator Sketch (Exhibit D)

5. A copy of the best available connection details from the design drawings, or best available information when possible

6. Appropriate completed data sheets (Exhibits G through M)

8.0 ITEMS AND EQUIPMENT REQUIRED FOR WALKDOWN

The teams taking only photographs and the teams collecting data should have available to them those items and equipment listed below that are necessary to perform their task.

8.1 Copy of walkdown package with signed-off coversheet in accordance with Section 7.3 and required data sheets.

8.2 The teams should also have available to them: flashlights, binoculars, writing pads and pencils, measuring devices such as rulers, and plastic bags for carrying items. Calibration controls are not required for standard off-the-shelf measuring equipment (e.g., rulers, tape measures). Welding engineers should also have standard welding gauges available to them.

8.3 High resolution cameras and telescoping scale to take scaled photographs as necessary.

8.4 Walkdown team members shall use hot tools when available for working in contaminated areas.

9.0 WALKDOWN PROCESS

9.1 Walkdown Team Members

9.1.1 Data Collection

The data collection walkdown will be performed by teams of at least two experienced walkdown personnel qualified in accordance with Section 5.0. Each team member will become familiar with the platform details and the contents of the walkdown package before they perform the walkdown.

Information from the best available design documents shall be transcribed on to the sheets (Exhibits G through M) prior to performing the field verification.

9.1.2 Weld Verification

The weld verification walkdown, when required, shall be performed by teams of at least two welding engineers qualified in accordance with Section 5.0. Each team member will have reviewed available photographs of the welded connections. They shall also be familiar with the miscellaneous steel and platform details and the contents of the walkdown packages, including the weld details as shown in the drawings.

9.2 Quality of the Walkdowns

In order to ensure adequacy and uniformity of the data collected and verifications performed during the walkdown process, an independent walkdown team shall randomly verify the data collected during walkdowns. The results obtained by the independent walkdown team shall be trended to determine and implement appropriate action(s), including additional training of walkdown personnel, as necessary.

The independent walkdown team personnel shall be qualified and trained in accordance with this procedure. These personnel may be used for conducting regular walkdown activities, however, they shall not verify their own work.

9.3 Tracking of Irregularities

When an irregularity is found within the scope of this program, no trouble-ticket will be issued per CP&L procedure AI-79. These irregularities will be documented in the walkdown packages and then evaluated by the controlled Engineering Evaluation Procedure.

If an irregularity or nonconformance outside the scope of this program is noticed by walkdown personnel, they shall inform the Project Walkdown Supervisor upon leaving the work area. He shall document the irregularity and transmit it to the CP&L Field Support Supervisor for disposition.

10.0 MEASUREMENT ACCURACY

The field measurements shall be made with the accuracies listed below unless other criteria are specified in the specific walkdown package.

10.1 Clip Angles

1.	Clip Angle Size:	
	a. Leg widths	±1/4"
	b. Thickness	±1/16"
	c. Edge Distance (Clip Angle)	±1/8"
2.	Bolt Gage (Clip Angle)	±1/4"

10.2 Members

1.	Flange width	±1/4"
2.	Section depth	±1/4"
3.	Flange Thickness	±1/16"
4.	Web thickness (when possible)	±1/16"

10.3 Surface-Mounted Plate

1.	Width and length	±1/2"
2.	Bolt edge distance	±1/4"
3.	Thickness	±1/16"

10.4 Attachments

1.	Location along the length of members	±6"
2.	Eccentricity with respect to centerline of frame members	±2"
3.	Location on the embed or surface-mounted plate	±1/2"

10.5 Bolts

1.	Diameter	Closest 1/8" increment
2.	Slot length (when possible)	±1/4"
3.	Hole diameter (if visible)	Closest 1/8" increment

10.6 Weld Length for length less than 3" −1/8"
for length 3" or longer -1/4"

10.7 Irregularities:

1.	Gaps	Greater than 1/4"
2.	Crack Lengths	±1/8"

11.0 DATA COLLECTION

11.1 Procedure

Prior to performing the walkdown, the best available design documents shall be collected and reviewed, including the latest available revisions of design drawings, fabrication and erection drawings, and modification documentation. This data shall be summarized and included in the forms identified in Exhibits G through M of this procedure. Additional data sheets and/or sketches may be prepared and used as necessary to describe design and field conditions.

Considering the difficulty of collecting data (particularly in high radiation areas, such as the drywell) the following procedure may be used:

a. Prior to data collection, photographs will be taken of each end connection, including the clip angles, bent plates, beam seats, bolts and/or welds. A sufficient number of scaled photographs should be taken to permit documentation of irregularities by examination of photographs. Each photograph should be positively identified with the related connection and walkdown package number. A ruler should be included in the photographs to determine thicknesses and dimensions.

b. Evaluation engineers and welding engineers will review the photographs and identify members and connections that will be subject to data collection and/or welding verification. The criteria for data collection is consistency with design drawings: only those connections which, based on the review of photographs, are judged to be different than that shown on the drawings should have detailed measurements taken. The criteria for welding verification is judgement based on experience: only those welds which, based on the review of photographs, are judged to be less than that shown on the design drawings or to have significant irregularities need to be walked down for verification.

c. Data will be collected by the walkdown teams on those connections identified in Item b.

d. Welding engineers will verify the welding of those connections identified in item b.

The accuracy by which the data in the following sections should be collected is given in Section 10.0.

11.2 Miscellaneous steel and drywell platform steel members identified in accordance with Section 11.1 will be walked-down to verify the following attributes:

11.2.1 Member Sizes

For wide flange, channels, and structural tees measure width, depth and flange thickness in order to identify the member size.

For angles, measure the width of both legs, and the thickness.

For structural tube, record the width and depth, and, if possible, the thickness. If thickness can not be measured, indicate in the notes.

Attachments to the member and data regarding the end connection should be recorded using the appropriate forms.

In addition, conditions that may result (or may have resulted) in reduced capacity should be noted, including:

1. Visible cracks, particularly at copes
2. Bent or warped flanges (for W and C shapes)
3. Bent webs
4. Unusual copes
5. Cutouts in webs and flanges
6. Wrong member orientation

Data to be recorded for members is indicated on Exhibit G.

Members will be identified using the following codes:

Wide Flange	W
Channel	C
S shapes	S
Angle	L
Structural Tees	ST
Structural Tubes	TS

11.2.2 Connections

1. Confirm that connection configuration is consistent with the design information. If not, indicate the differences on the forms, if possible. Otherwise prepare a sketch to show details and/or take a photograph of the connection.

2. If connection includes clip angles, seat angles, or restraining angles, measure the thickness and width of each leg to identify the angle size.

3. Verify the dimensions of stiffeners on seat angles, if they exist.

4. Record if an angle shown on design drawings is made of bent plate. A bent plate can generally be recognized by the lack of a square corner and greater inside radius. Verify all bent plates for cracks. If cracking is present, record the length and provide a sketch showing its location.

5. Record excess gaps between faying surfaces on Exhibit G.

6. Record any significant bending or distortion to angles.

Data to be collected for clip angles and beam seats and restraining angles are shown on Exhibit J, and K, respectively.

11.2.3 Welded connections

1. Compare weld locations and length with design information. Record differences, as necessary.

2. Evaluate the welds using the criteria given in Appendix A for the indicated parameters and fill out Exhibit A-1.

11.2.4 Bolted connections

1. Compare number of bolts with design information and record differences.

2. Note diameter of bolts and compare with design information. (Go-No go gauges may be used to determine bolt diameter.)

3. If possible, note markings on bolt and identify it as an A 325, A 490, or other.

4. Record if bolt is loose (gaps exist between head, or nut, and clamped elements).

5. Measure the closest distance between two adjacent bolts and compare with design information.

6. Measure minimum edge distance between bolt and edge of clamped component.

7. Note if washers do not exist.

Data to be collected on bolted connections are shown on Exhibit J and Exhibit K, for clip angle, and beam seat and restraining angle connections, respectively.

11.2.5 Attachment locations

IEB 79-14 supports have been located as part of the CP&L walkdown. This information should provide the location on the beam and any eccentricity. During the first four walkdowns in Unit 2, these attachments will be verified visually and their locations will be checked. The walkdown team shall identify these attachments on the walkdown package before making field verification using the Exhibit H form. If the data is within the accuracy required by this procedure, verification of the location of these supports will be deleted from the program.

Identify the location and type of attachments of piping greater than 10" in diameter and cable tray supports with more than 4 trays. Piping smaller than 10" diameter (except those included in the 79-14 program), cable trays with less than about 4 tiers, conduits and HVAC will be included in equivalent uniform (smeared) loads. For these commodities, equivalent area or line loads on members will be determined as defined on a footprint or on a plan area basis by a detailed attachment load survey of one segment of the reactor building and drywell at two or more different elevations.

Data to be collected on attachments is shown on Exhibit I.

If the attachment is more than 2 inches eccentric with respect to the reference point shown on Exhibit I, it should be recorded on the applicable forms. In addition, attachment stiffener plates and welds should be identified and recorded.

11.2 Embed plates

Embed plate attributes needed to identify the embed type and verify the load-carrying capability shall be recorded. Data to be collected includes:

1. Surface width and length (very long embeds should be so indicated without measuring)

2. Length of welds

3. Location of the attached member. This can be identified by measuring the offsets to any two corners of the member.

4. Location and identification of other attachments on the same embed within 24 inches of the connected member.

5. Location of openings, abandoned holes, other embeds, or surface-mounted plates within 12 inches of the edge of the embed.

6. Any significant damage to the embed or separation from the concrete over a large area.

Data to be collected on embed plates is shown on Exhibit L.

11.3 Surface-Mounted Plates

Surface-mounted plate and anchorage attributes needed to identify the type of plate and verify the load-carrying capacity shall be recorded.

11.3.1 Surface-Mounted Plates:

1. Surface width, length, and thickness

2. Length of welds to the attachment

3. Location of the attached member. This can be identified by measuring the offsets to any two corners of the member.

4. Location and identification attachments on the same plate within 24 inches of the connecting member.

5. Location of openings, abandoned holes, embeds, or other SMPs within 12 inches of the edge of the surface-mounted plate.

6. Any significant damage to the surface-mounted plate or separation from concrete over a large area.

11.3.2 Expansion Anchors and Anchor Bolts on Surface-Mounted Plates

Compare the following with the design information and record differences and/or irregularities.

1. Size and type of anchor (if visible marks exist)
2. Number of anchors
3. Location of anchors on plate
4. Flame cut holes (if visible)
5. Oversize holes (if visible)
6. Loose or missing bolts
7. Concrete edge distance (if within 12" inches of bolt centerline)
8. Abandoned holes within 12 inches of bolt centerline
9. Thread engagement less than flush with the surface of the nut

12.0 WALKDOWN DOCUMENTATION

12.1 Documentation Sign-offs

12.1.1 The area sketches (which define the scope and show member and connection ID number) used in the data collection walkdown and all data sheets, photographs, and/or sketches shall be signed by the package preparer, package checker, and Walkdown Group Supervisor prior to the walkdown. The walkdown team members shall also sign all data sheets and sketches after completion of the walkdown, signifying all member connections have been verified as required.

12.1.2 The verification reports by the weld engineers shall be signed and dated by both members of the welding verification walkdown team. These reports shall be included in the appropriate Phase II Walkdown Package.

12.1.3 The Phase II Walkdown Package Cover Sheet shall be signed by the walkdown team members in appropriate blocks. The package will be reviewed by the Project Walkdown Supervisor and signed and dated.

12.1.4 The final Phase II Walkdown Package shall be filed and maintained by area.

12.2 Changes to Walkdown Packages

Revision to walkdown packages, including correction of editorial and transcription errors, obtaining additional data, and additional or revised calculations, shall be checked, reviewed, and approved in the same manner as the original walkdown package. Revisions shall be identified by a bar on the margin or encircling the revised item. The revision number shall be updated and the revision preparers and revision date shall be identified.

12.3 Electronic Database

An electronic database will be created listing all the identified members verified as part of the walkdown. They will be listed by their unique identification numbers and cross-referenced to their walkdown package and the design drawing used.

12.4 Completed Walkdown Package

12.4.1 The completed Phase II Walkdown Package will consist of the following, as a minimum:

1. Completed Walkdown Package Cover Sheet (Exhibit A)
2. Walkdown Package Index Sheet (Exhibit B)
3. Walkdown Drawing List (Exhibit C)
4. A copy of Area Designator Sketch (Exhibit D)
5. Area Sketch(es) (Exhibit E)
6. Appropriate Data Sheets, and attachments (Exhibits G through M)
7. All photographs
8. Welding Verification Data Sheets (Exhibit A-1), if any

12.4.2 All sheets in the walkdown package shall be appropriately numbered.

12.4.3 The walkdown package shall be reviewed by the Project Walkdown Supervisor to ensure that it is complete and data is sufficient for engineering analysis prior to issuing as Rev. 0. If a calculation is involved, the engineer will obtain the calculation number and enter it in block 10. If no calculation is required, N/A will be entered in block 10.

12.4.4 Completed and revised walkdown packages shall be forwarded to Bechtel Document Control for distribution to Bechtel Engineering and others in accordance with the Project Master Distribution Schedule. CP&L Document Control will ensure completed packages are vaulted and input into NRCS.

12.4.5 The final walkdown packages shall be filed and the files maintained by Bechtel Document Control until completion of the project and then transferred to CP&L for permanent retention.

13.0 REFERENCES

1. EDP 5.34 - "Indoctrination/Orientation and Training," Revision 0

2. Installation of Seismic Pipe and HVAC Supports and Miscellaneous Steel, Specification 248-107, Rev. 14

3. AI-79, Rev. 006

4. AI-107, Rev. 1

5. BSEP Field Engineering Inspection (As-Building), NED Guideline E-9, Rev. 0

6. Specification for Furnishing and Installation of Miscellaneous Iron & Steel, Specification No. 018-002, Rev. 4, January 1986

7. Specification No. 9527-01-12-2, Specification for Sacrificial Shield and Drywell Interior Structural Steel

14.0 EXHIBITS

A - Phase II Walkdown Package Cover Sheet
B - Walkdown Package Index Sheet
C - Walkdown Drawing List
D - Walkdown Area Designator
E - Area Sketches
F - Physical Irregularities Checklist
G - Structural Member Data Sheet
H - 79-14 Pipe Support Attachment Location
I - Attachment Data Sheet
J - Clip Angle Data Sheet
K - Seat and Restraining Angle Data Sheet
L - Embed Data Sheet
M - Surface-Mounted Plate Data Sheet

PHASE II WALKDOWN PACKAGE
COVER SHEET
WALKDOWN PACKAGE NO. _____

1. Bechtel Job No. _____
2. Walkdown Package No. _____
3. Reference Drawing No. _____
4. Area _____
5. Unit _____
6. Building _____
7. Package Preparer _____ Date _____
8. Package Checker _____ Date _____
9. Walkdown Group Supervisor _____ Date _____
10. WDP-002 Log Control Number _____

REV.	TEAM MEMB. #1	TEAM MEMB. #2	PROJECT WALKDOWN SUPERVISOR	DATE	REASONS FOR REVISION

PHASE II WALKDOWN PACKAGE

INDEX SHEET

WALKDOWN PACKAGE NO. _____

Package Number: _____

Unit No. _____ Building _____ Area _____

CONTENTS

YES	NO	
_____	_____	Walkdown Package Cover Sheet (1 page)
_____	_____	Index Sheet (__ pages)
_____	_____	Walkdown Design Drawing List (1 page)
_____	_____	Area Designator Sketch (1 page)
_____	_____	Area Sketches (__ pages)
_____	_____	Physical Irregularities Checklist
_____	_____	Structural Member Data Sheet
_____	_____	79-14 Pipe Support Attachment Location
_____	_____	Attachment Data Sheet
_____	_____	Clip Angle Data Sheet
_____	_____	Seat and Restraining Angle Data Sheet
_____	_____	Embed Data Sheet
_____	_____	Surface Mounted Plate Data Sheet
_____	_____	Connection Details (__ pages)
_____	_____	Weld Verification Data Sheet
_____	_____	Additional Documents or Information (as listed below) (___ pages)

_____

_____

_____

_____

_____

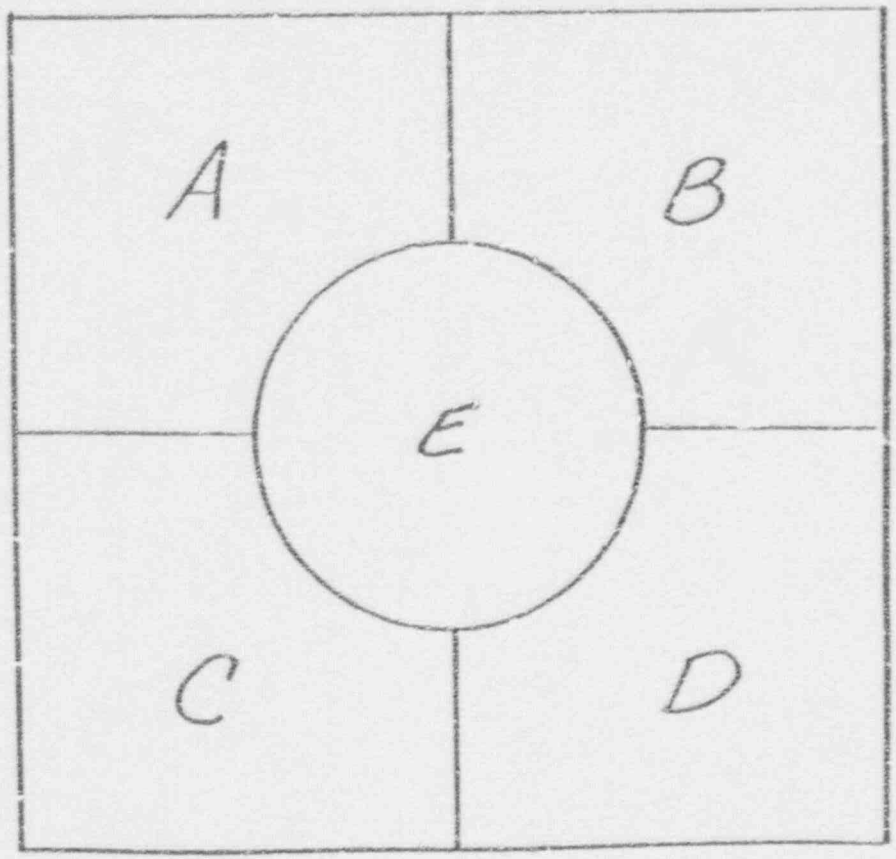
PHASE II WALKDOWN PACKAGE NO. _____ PAGE ___ OF ___

WALKDOWN DRAWING LIST

DRAWING NUMBER	REV.	DRAWING NUMBER	REV.

PLANT NORTH

UNIT 1 OR 2



MAIN DRAIN AREA

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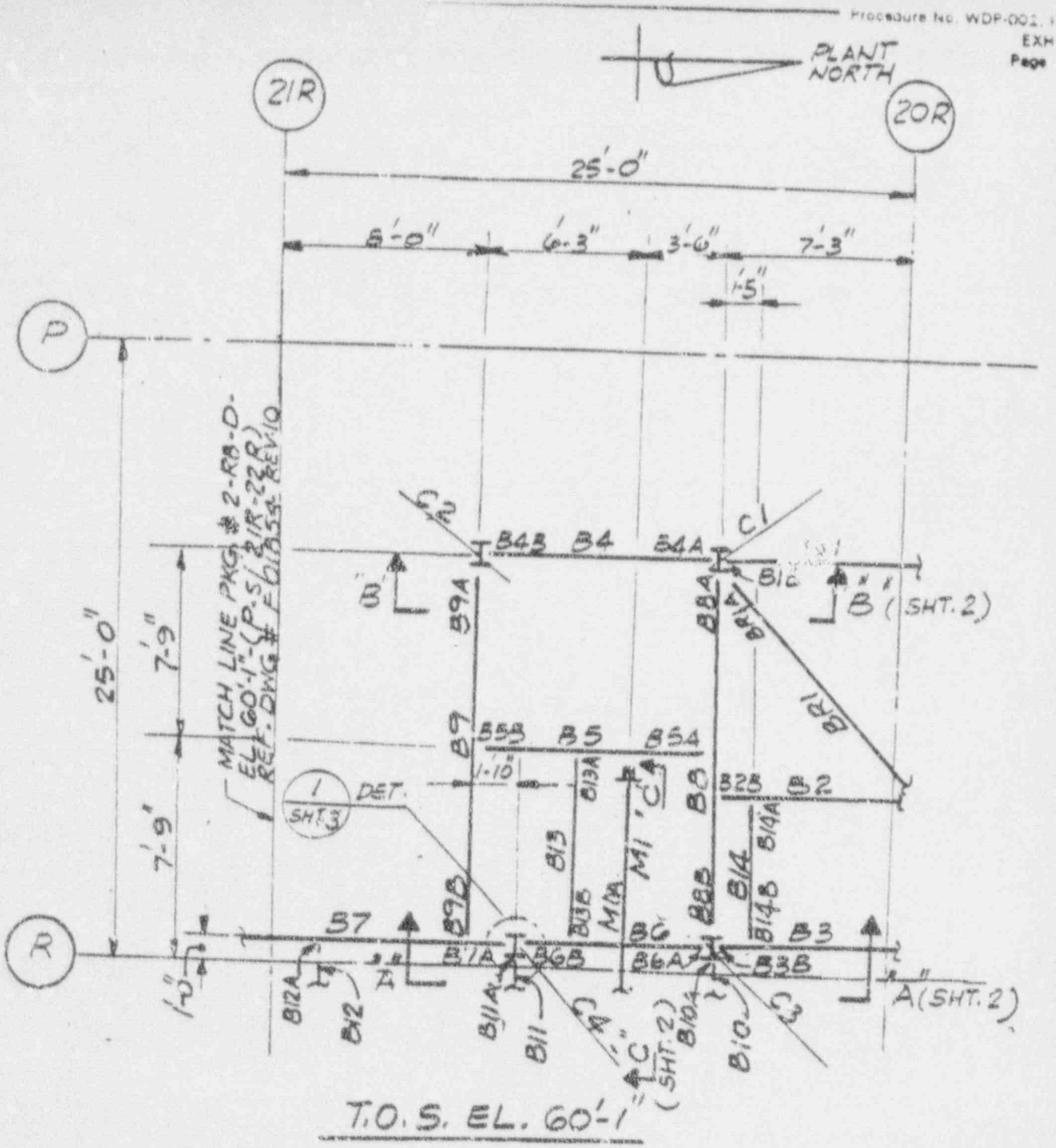

TEAM MEMBER # 1: [signature] DATE: 7/7/92

TEAM MEMBER # 2: [signature] DATE: 7/7/92

NO.	DATE	REVISIONS	BY	CK'K
	6-22-92	PREPARED FOR PHASE II WALKDOWN	HKH	

SCALE NTS
ORIGIN
DESIGNED —
DRAWN HARI HARJAI

PKG. #2-RB-B-EL 60'-1" (P-R/20R-21R)
REF. DWG. #: F-01854 REV. 10

DESIGN ENGR —
CHIEF ENGR —
PROJ. ENGR —
JOB NO. 21963
DRAWING NO.

SHT. 1 OF 3

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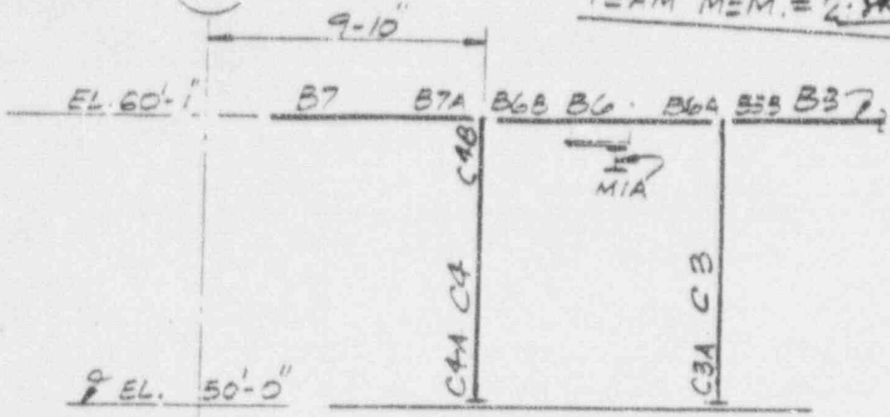
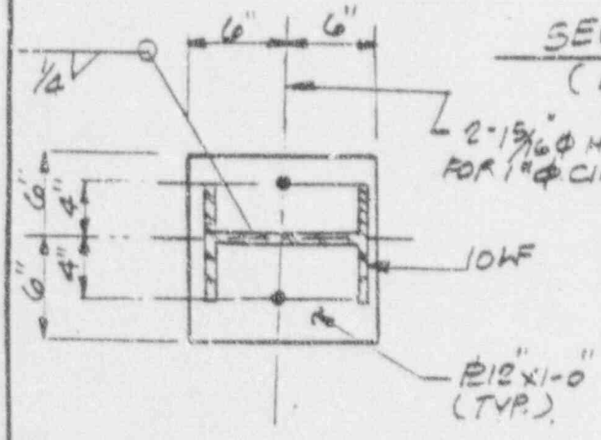
TEAM MEM. # 1: [signature] DATE

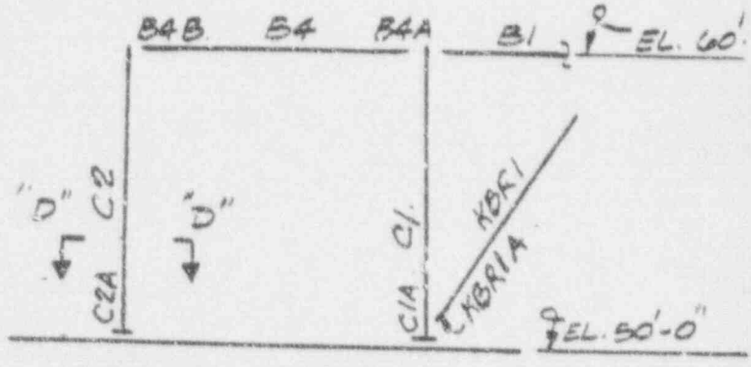
TEAM MEM. # 2: [signature] DATE



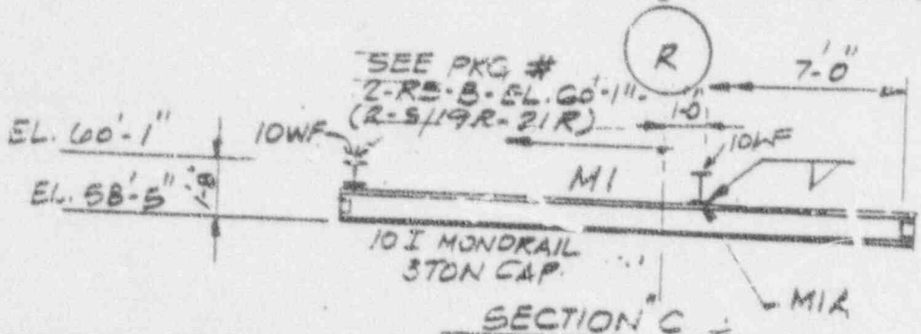
SECTION "A"-"A"
(LOOKING WEST)



TYPICAL BASE PLATE
SECTION "D"-"D"



SECTION "B"-"B"
(LOOKING WEST)



SECTION "C"
(LOOKING SOUTH)

NO.	DATE	REVISIONS	BY	CHK'D
	6-22-92	PREPARED FOR PHASE E WALKDOWN	HKH	QK

SCALE — DESIGNED — DRAWN HARI HARJAI — CHK'D — DESIGN ENG'R — ENG'R — PROJ ENG'R

ORIGIN

PKG # 2-RB-B-EL.60'-1" (P-R/20R-21R)
REF. DWG # F-01854 REV. 10.

JOB NO. 21963.

DRAWING NO.

SHT 2 OF 3

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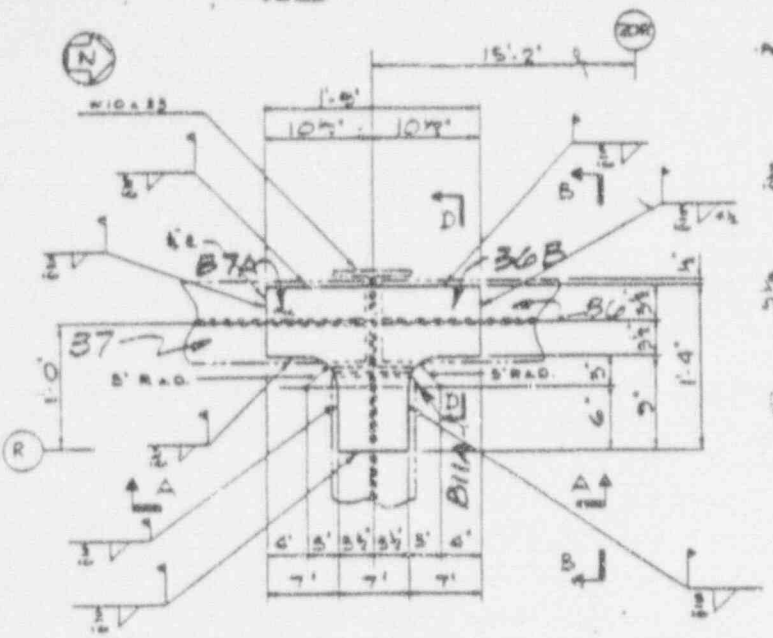
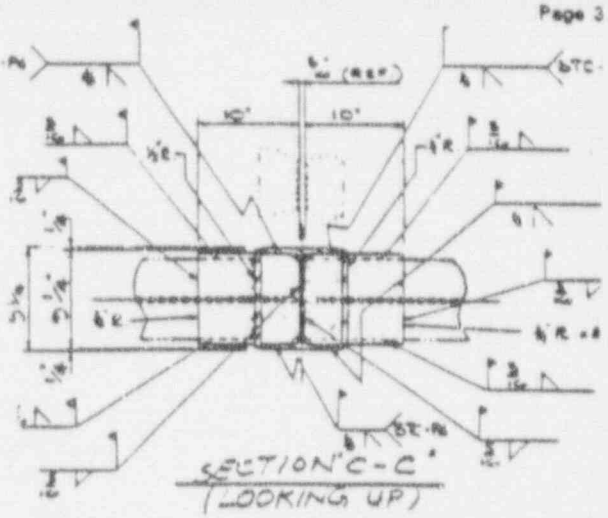
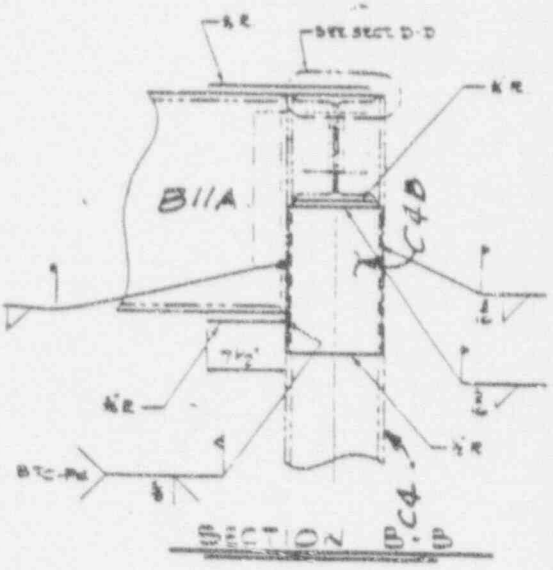
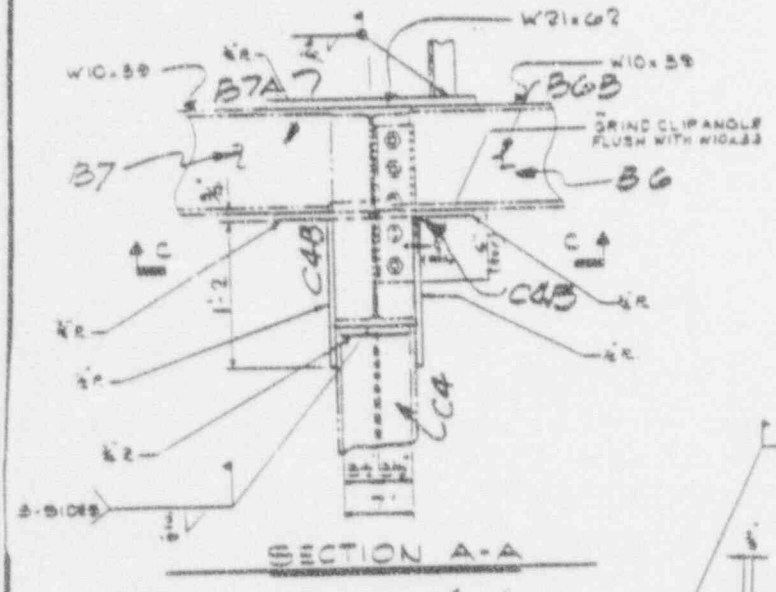


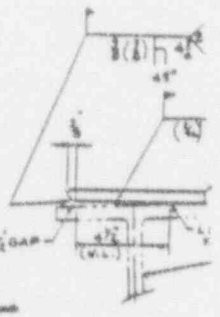
PLAN



DETAIL 1 SHT
SEE SHT.-1







NOTES:

1. SUPPLY FABRICATE, INSPECT AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH DSEP SPECIFICATION 248-107, REV. 1.
2. PAINT IS TO BE AS FOLLOWS:
   PRIME COAT AND STEEL PREPARATION SHALL BE TO USC SPEC. 16-E.
   FINISH SHOP COAT AND FIELD TOUCH UP SHALL BE TO USC SPEC. 41-J.

TEAM MEM. # 1: [signature] DATE: 7/8/92
TEAM MEM. # 2: [signature] DATE: 7/7/92

REFERENCE DRAWINGS:
1. F-1854 R1 BLDG. MISC. STL. PLAN BETW EL. 30'-0" & EL. 80'-0"

NO.	DATE	REVISIONS	BY	CHK'R	DESIGN MGR	ENG'R	PROJ ENG'R
	6-22-92	~~ISSUED~~ FOR PHASE II WALKDOWN	HKH	[signature]	—	—	—
		PREPARED			CHIEF ENGR	—	—

SCALE NTS
ORIGIN
DESIGNED —
DRAWN HARI HARJAI

BECHTEL

PKG # 2-RB-B-EL. 60'-1" (P-R/20R-21R)
REF. DWG # F-01854 REV. 10

JOB NO. 21963
DRAWING NO.
SHT 2 OF 2

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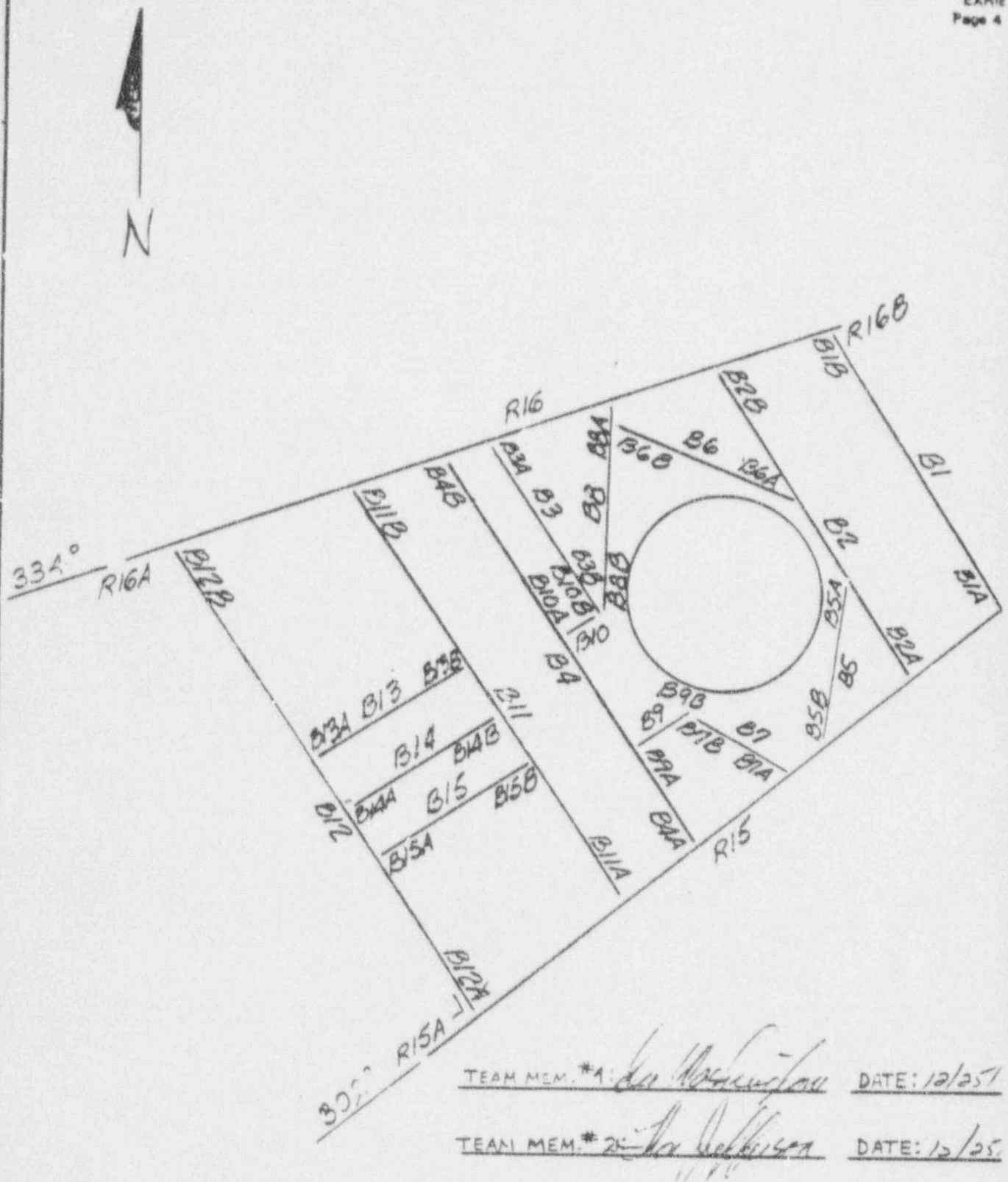

TEAM MEM. #1: [signature] DATE: 12/25/

TEAM MEM. #2: [signature] DATE: 12/25/

No.	DATE	REVISIONS	BY	CHK'R	DESIGN SUPV	BR'CH'R	PROJ ENGR
	7/9/93	PREPARED FOR WALKDOWN PHASE II	CRL	OBI	-	-	-

SCALE NTS
ORIGIN
DESIGNED
DRAWN TB/CRL
CHIEF ENGR -

PKG #: 2-E-EL17-10"-(302°-334°)
REF. DWG. #: F-01901 SH. 1, REV. 1

JOB NO. 21963
DRAWING NO.

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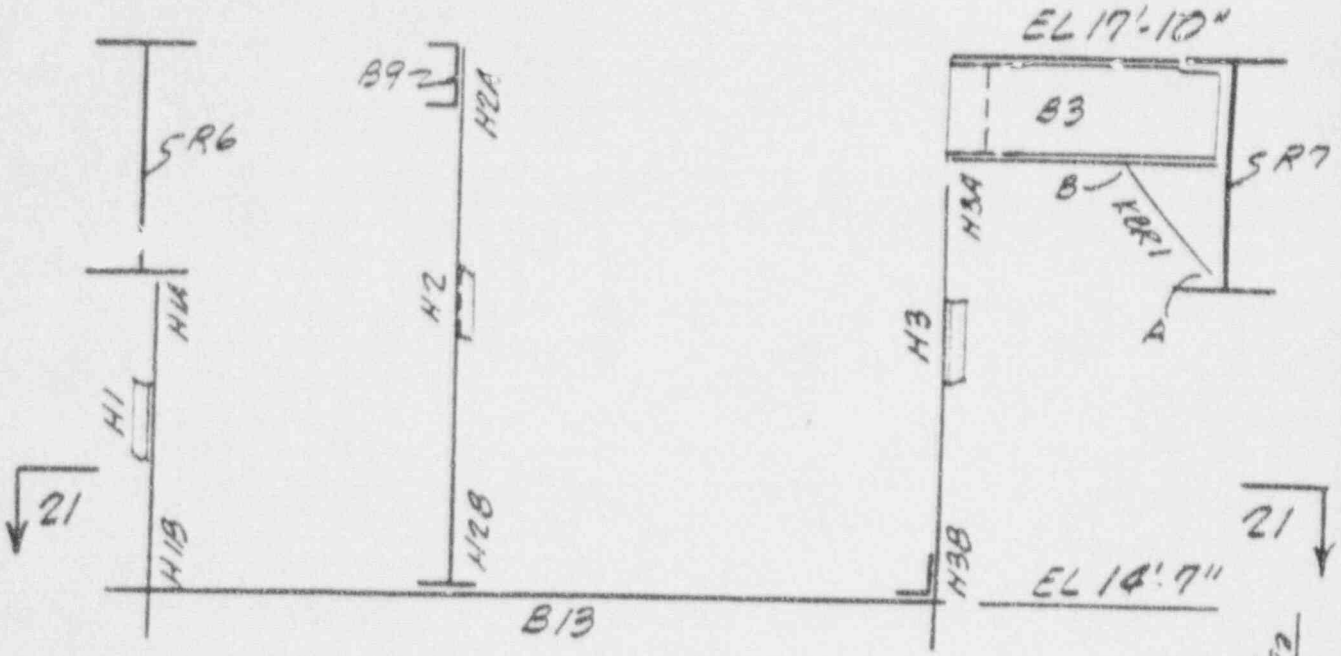
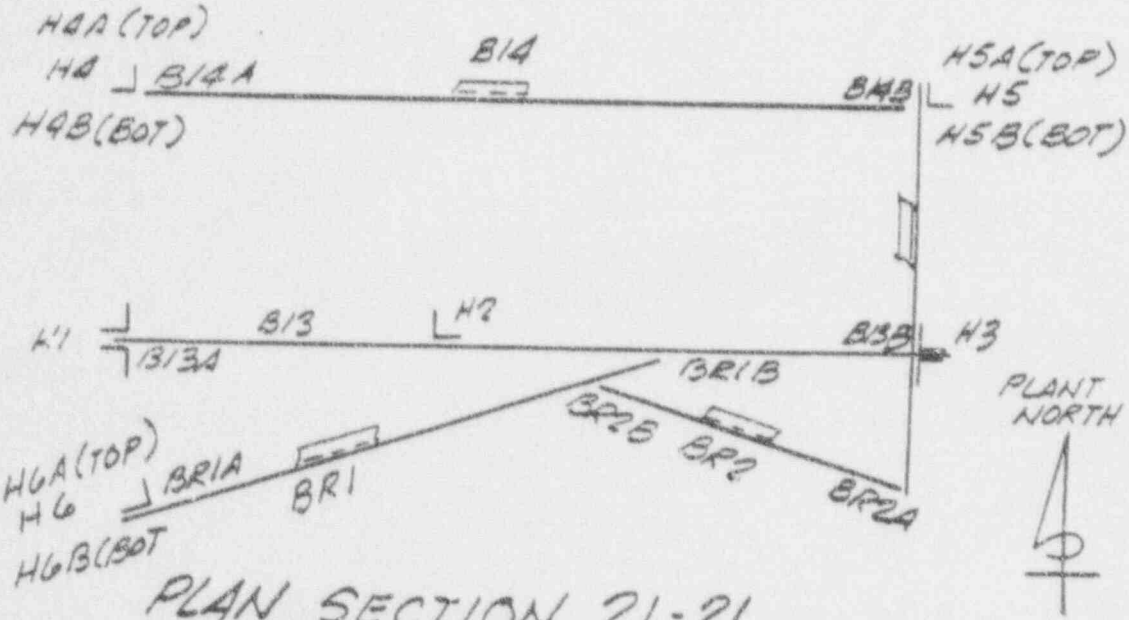


SECTION 20A-20A



PLAN SECTION 21-21
(EL 14'-7")

DATE: 12/23/92

TEAM MEM #1: [illegible]

No.	DATE	REVISIONS	BY	CH'K	DESIGN SUPV	ENG'R	PIPING ENGR
2	7/8/92	PREPARED FOR WALKDOWN PHASE II	CBK	ODI			
1							
0							

SCALE 1:75 | DESIGNED | DRAWN J. DEZA | CHIEF ENGR

ORIGIN

PK6 "1-E-EL 17'-10" (307°-334°)
REF DWG #: F-0190 SH.1 REV. 1

JOB NO. 21963

DRAWING NO.

SH. 2 OF 2

PHASE II WALKDOWN PACKAGE
PHYSICAL IRREGULARITIES CHECKLIST

NO. IRREGULARITY

Design/Construction

1. Weld Missing
2. Weld Undersized
3. Weld in Lieu of Bolt or Bolt in Lieu of Weld
4. Washer Missing
5. Oversize Bolt Hole
6. Flame Cut Bolt Hole
7. Welds on Bolts or Nuts
8. Lack of Thread Engagement
9. Abandoned Connection
10. Gap Between Beam and Beam Seat
11. Deformation of Embedded PL. (Bowed, Pulling Out, etc.)
12. Connection Member Size (not as shown on design drawing)
13. Structural Member Size not as shown (by visual observation)
14. Twisting of Member
15. Bent or Deformed Member

Maintenance

1. Bolt Missing
2. Bolt Loose
3. Washer Missing
4. Nut Missing
5. Welds on Bolts or Nuts
6. Lack of Thread Engagement
7. Connection Member Missing
8. Abandoned Connection
9. Gap Between Beam and Beam Seat

PHASE II WALKDOWN PACKAGE
STRUCTURAL MEMBER DATA SHEET
WALKDOWN PACKAGE NO. _____
MEMBER ID _____

		Drawing	*Actual*
1.	Member Size	_____	_____
2.	Member Type	W S C L ST TS	W S C L ST TS
3.	Flange Width (in)	_____	_____
4.	Depth (in)	_____	_____
5.	Thickness (flg or leg) (in)	_____	_____
6.	Does drawing agree with actual		_____/_____ Y N

Check (✓) appropriate response. If response is "✓" complete required form

7.	79-14 pipe supports (Exhibit H)	_____
8.	Major attachments (Exhibit I)	_____

Identify the following items, when they exist, by checking (✓) the appropriate line.[1]

		A	B	A	B
9.	Clip angle (left)	_____	_____	_____	_____
10.	Clip angle (right)	_____	_____	_____	_____
11.	Seat angles	_____	_____	_____	_____
12.	Restraining angles	_____	_____	_____	_____
13.	Bent plate	_____	_____	_____	_____
14.	Emoed plate	_____	_____	_____	_____
15.	Surface mounted plate	_____	_____	_____	_____
16.	Base plate	_____	_____	_____	_____
17.	Fully welded connection	_____	_____	_____	_____

For the following items, if response is "N", describe:

				Remarks
18.	Free of cracks at copes?	Y	N	_____
19.	Flanges free of warping?	Y	N	_____
20.	Webs free of distortion?	Y	N	_____
21.	Gaps between connected members acceptable? (< ¼")	Y	N	_____
22.	Free of visible damage?	Y	N	_____
23.	Cope length (worst case)			_____

24. Distance between beam web and surface of the connected member _____
25. Additional Comments:

_____

[1] *A refers to the "A connection," B refers to the "B connection." Left is left of the observer standing at connection A and looking at B.*

PHASE II WALKDOWN PROCEDURE

79-14 PIPE SUPPORT ATTACHMENT LOCATION

WALKDOWN PACKAGE NO. _____

MEMBER ID _____

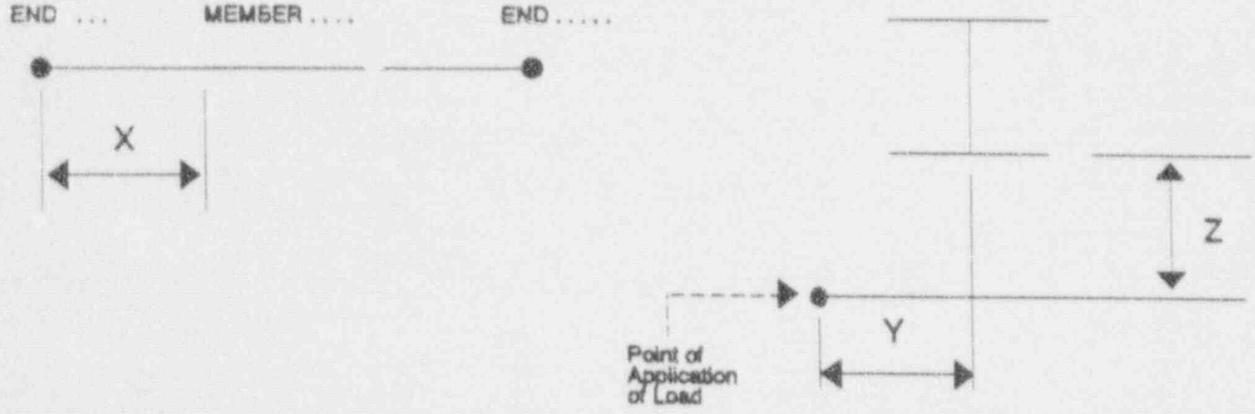
(Information taken from 79-14 walkdown data prepared by CP&L).

	CP&L Data	Field Check (as required)
Support No._____	Attachment Point[2]_____	Attachment Location[3]_____
	x:_____	x:_____
	y:_____	y:_____
	z:_____	z:_____
Support No._____	Attachment Point[2]_____	Attachment Location[3]_____
	x:_____	x:_____
	y:_____	y:_____
	z:_____	z:_____
Support No._____	Attachment Point[2]_____	Attachment Location[3]_____
	x:_____	x:_____
	y:_____	y:_____
	z:_____	z:_____
Support No. _____	Attachment Point[2]_____	Attachment Location[3]_____
	x:_____	x:_____
	y:_____	y:_____
	z:_____	z:_____

Notes:

1. For definition of X, Y, Z, see Exhibit I.
2. If support has more than one attachment to the beam, identify each attachment point as A, B, etc.
3. Attachment Location: Top Flange (TF), Web (W)f, Bottom Flange (BF), etc.

PHASE II WALKDOWN PROCEDURE
ATTACHMENT DATA SHEET
WALKDOWN PACKAGE NO. _____



ITEM TYPE:
- P1 = 79-14 PIPING (> 4" diam)
- P2 = NON-79-14 PIPING (> 10" diam)
- CT = CABLE TRAY (> 4 tiers)
- PR = PIPE RESTRAINT
- OT = OTHER

SUPPORT TYPE:
- R = ROD
- C = CANTILEVERED
- B = BRACED
- F = FRAME
- O = OTHER

ITEM						SUPPORT BRACE/FRAME DISTANCE		AVERAGE SPAN			
NO.	TYPE & SIZE	X	Y	Z	SUPPORT TYPE	TRANS	LONG	VER	TRANS	LONG	NOTES

PHASE II WALKDOWN PACKAGE
CLIP ANGLE DATA SHEET
WALKDOWN PACKAGE NO. _____

1. Connection Designation _____

2. Connection Data

	DRAWINGS		ACTUAL	
a. Angle size (web side first)	___x___x___		___x___x___	
b. Angle length	_____		_____	
	WEB	OUTST. LEG	WEB	OUTST. LEG
c. Bolted (B) or Welded (FW, SW)[1]	___	___	___	___
d. Number of bolts	___	___	___	___
e. Bolt type (A325) (A490)	___	___	___	___
f. Bolt size	___	___	___	___
g. Minimum edge distance to bolt [Angle (A), Web (W), Flange (F)]	___	___	___	___
h. [2]Weld Length				
top left	___	___	___	___
top right	___	___	___	___
side left	___	___	___	___
side right	___	___	___	___
bottom left	___	___	___	___
bottom right	___	___	___	___

3. Connection Irregularities (describe "N" responses)

	Y OR N		REMARKS
a. Free of cracks?	Y	N	_____
b. Gaps between faying surfaces acceptable? (< ¼")	Y	N	_____
c. Slotted holes regular? (indicate if on drawing)	Y	N	_____
d. Free of visible flame cut holes?	Y	N	_____
e. Bolts visibly tight/nuts in place?	Y	N	_____
f. Full thread engagement (indicate number of bolts/worst case threads not engaged)	Y	N	_____
g. Bolts are in place?	Y	N	_____
h. Welds per design drawings?	Y	N	_____

[1] *FW = Field Weld, SW = Shop Weld*

[2] *Left is left of the observer standing at connection A and looking at B.*

PHASE II WALKDOWN PACKAGE
SEAT AND RESTRAINING ANGLE DATA SHEET
WALKDOWN PACKAGE NO. _____

SEAT ANGLE

1. Connection Designation _____

2. Seat Angle Data

		DRAWINGS		ACTUAL	
a.	Angle size (beam flange side first)	___x___x___		___x___x___	
b.	Stiffener size, if exists	_____		_____	
		FLANGE	OUTST. LEG	FLANGE	OUTST. LEG
c.	Bolted (B) or Welded (FW, SW)[1]	___	___	___	___
d.	Number of bolts	___	___	___	___
e.	Bolt type (A325) (A490)	___	___	___	___
f.	Bolt size	___	___	___	___
g.	Minimum edge distance to bolt [Angle (A), Web (W), Flange (F)]	___	___	___	___
h.	Weld Length				
	top	___	___	___	___
	sides	___	___	___	___

3. Seat Angle Irregularities (describe "N" responses)

		Y OR N		REMARKS
a.	Free of cracks?	Y	N	
b.	Gaps between faying surfaces acceptable? (< ¼")	Y	N	
c.	Slotted holes regular? (indicate if on drawing)	Y	N	
d.	Free of visible flame cut holes?	Y	N	
e.	Bolts visibly tight/nuts in place?	Y	N	
f.	Full thread engagement (indicate number of bolts/worst case threads not engaged)?	Y	N	
g.	Bolts in place?	Y	N	
h.	Welds per design drawings?	Y	N	

[1] *FW = Field Weld, SW = Shop Weld*

PHASE II WALKDOWN PACKAGE
SEAT AND RESTRAINING ANGLE DATA SHEET
WALKDOWN PACKAGE NO. _____

RESTRAINING ANGLE

1. Connection Designation _____

2. Angle Data

	DRAWINGS		ACTUAL	
a. Angle size (beam flange or web side first)	____x____x____		____x____x____	
b. Stiffener size if exists	_____ _____		_____	
	FLANGE or WEB	OUTST. LEG	FLANGE or WEB	OUTST. LEG
c. Bolted (B) or Welded (FW, SW)[1]	_____	_____	_____	_____
d. Number of bolts	_____	_____	_____	_____
e. Bolt type (A325) (A490)	_____	_____	_____	_____
f. Bolt size	_____	_____	_____	_____
g. Minimum edge distance to bolt (Angle (A), Web (W), Flange (F))	_____	_____	_____	_____
h. Weld Length				
• for beam web connection				
top and bottom (ends)	_____	_____	_____	_____
side	_____	_____	_____	_____
• for beam flange connection				
ends	_____	_____	_____	_____
side	_____	_____	_____	_____

3. Seat Angle Irregularities (describe "N" responses)	Y OR N		REMARKS
a. Free of cracks?	Y	N	_____
b. Gaps between faying surfaces acceptable? (< ¼")	Y	N	_____
c. Slotted holes regular? (indicate if on drawing)	Y	N	_____
d. Free of visible flame cut holes?	Y	N	_____
e. Bolts visibly tight/nuts in place?	Y	N	_____
f. Full thread engagement (indicate number of bolts/worst case threads not engaged)	Y	N	_____
g. Bolts in place?	Y	N	_____
h. Welds per design drawings?	Y	N	_____

[1] *FW = Field Weld, SW = Shop Weld*

EMBED DATA SHEET

WALKDOWN PACKAGE NO. _____

1. Connection _____

2. Embed No _____

3. Embed and Attachment Data

	Drawing	*Actual*
a. Drawing No.	_____	
b. Width	_____	_____
c. Length	_____	_____
d. Minimum distance between attachment and edge of embed	_____	_____

4. Embed Irregularities (describe "N" responses)

					Remarks
a. No other attachments inside influence zone?[1]	Y	N	Y	N	_____
b. No free edges, abandoned holes penetrations, or other embed/surface mounted plates 12" or less from embed?[2]	Y	N	Y	N	_____
c. Warping acceptable? < ¼" per ft.)			Y	N	_____
d. Gaps between embed and concrete acceptable?[2] < ¼")			Y	N	_____

REMARKS: _____

_____

_____

[1] *On the same embed and 24 inches or less from member attachment.*

[2] *If "N" provide description, location, and attachment size on sketch, if different than design drawing.*

PHASE II WALKDOWN PROCEDURE

SURFACE-MOUNTED PLATE (SMP) DATA SHEET

WALKDOWN PACKAGE NO. _ _____

1. Connection _____
2. SMP No. _____

3. SMP Data:

		Drawing	*Actual*
a.	Drawing No.	_____	_____
b.	Width	_____	_____
c.	Length	_____	_____
d.	Thickness	_____	_____
e.	Size and type of anchor	_____	_____
f.	Bolt locations from SMP edge	_____	_____
g.	Minimum distance between attachment and SMP edge	_____	_____

4. SMP Irregularities (describe "N" responses)

					Remarks
a.	Are there no other attachments inside the influence zone?[1]	Y	N	Y	N	_____
b.	Are there no other surface-mounted plates within 12" of SMP?[2]	Y	N	Y	N	_____
c.	Are there no concrete edges 12" or less from anchor bolts?[2]	Y	N	Y	N	_____
d.	Are there no abandoned holes or penetrations 12" or less from SMP?			Y	N	_____
e.	Free of flame cut holes (if visible)?			Y	N	_____
f.	Oversize holes (if visible) acceptable?			Y	N	_____
g.	Bolts visibly tight?			Y	N	_____
h.	All bolts in place?			Y	N	_____
i.	Full thread engagement (indicate number of bolts/worst case threads not engaged)?			Y	N	_____
j	No warping or separation from conc. acceptable?[2]			Y Y	N N	_____ _____

REMARKS: _____

[1] *On the same SPM and 24 inches or less from n. : sber attachments.*

[2] *Pr· ide description, location, and attachment size on sketch, if different than design drawing.*

Appendix A
WELD VERIFICATION

A.1 Weld Verification Criteria

Weld lengths shall be obtained by walkdown personnel or from the high resolution photographs. Weld sizes and all other weld attributes shall be verified by welding engineers. The welding engineers who will perform the weld verifications shall be designated by the Bechtel M&QS Manager and be qualified in accordance with Section 5.0.

A.2 Extent of Verification

The welds that will be subject to field verification may be identified from the photographs of connections as stated in Section 11.1 of WDP-002. All welds identified for visual examination shall be verified by two welding engineers using this Appendix A.

Where configuration of the structure or obstructions prevent direct measurement of the weld, the weld symbol shall be reported as "not obtainable (N/O)."

A.3 Attributes to be Verified

The verification of welds included in the scope of this walkdown is limited to the determination and recording of the following weld attributes:

1. *Length:* Weld joint shall be considered welded full length, unless otherwise noted by the weld symbol.

2. *Location:* As specified on the drawing.

3. *Size:* Measure and record fillet weld size; for unequal leg fillet welds, record the size of smaller leg.

4. *General:* It is recognized that surface coatings and surface slag may mask many attributes. Welding walkdown team members shall make the best determination possible without the removal of coatings or slag.

A.3.1 Weld Length and Location

1. Evaluation Guidelines: Welds should be visually evaluated to determine that they are in the locations shown on the design drawings. Weld length should be measured as follows:

   For weld lengths less than 3 inches, a tolerance -1/8 inch shall be applied to the recorded length. For welds 3 inches or longer, a -1/4 inch tolerance shall apply.

   Welds are usually designated as full length of the member or continuous. When the length of a weld is specified, it usually applies to intermittent welding, such as, "3 inches long at 12 inches center-to-center," or "6 inches long at 12 inches center-to-center." The total sum of the lengths of the intermittent welds is more important than the actual length of the individual intermittent welds. Either way, a 1/8 inch or 1/4 inch measuring accuracy shall be used.

   Intermittent welds may be located within 1 inch of the designated location.

   Measurements shall be rounded off to the nearest 1/16 inch for size; and to the nearest 1/8 or 1/4 inch for length; and to the nearest inch for location of intermittent welds.

A.3.2 Fillet Weld Size

1. Acceptance Criteria: A fillet weld shall be permitted to be less than the size recorded by 1/16 inch for 1/4 the length of the weld.

2. Evaluation Guidelines: The team member shall measure weld size using appropriate measuring devices. Potentially undersize areas are the most appropriate locations for measuring weld size. Such areas can usually be determined by viewing the weld length.

   Scales or fillet weld gauges should be used for measuring the size of welds. Measurement increments of 1/16th inch are appropriate for these gauges. The welding engineers have the responsibility for determining weld size but continuous measurement of size over the full length of the weld is not mandatory.

A.3.3 Incomplete Fusion

1. Acceptance Criteria: In fillet welds, incomplete fusion of 3/8 inch in any 4-inch segment and 1/4 inch in welds less than 4 inches long, is acceptable. For groove welds, incomplete fusion is not acceptable. For fillet and groove welds, rounded end conditions that occur in welding (starts and stops) shall not be considered indications of incomplete fusion and are irrelevant.

2. Evaluation Guidelines: Evaluation for incomplete fusion shall be performed by visually examining the weld. The wetting and flow of weld metal at the fusion lines is the best indication of fusion. Indications of incomplete fusion at the start and stop of a weld that are observed only at the weld root are not indicative of the fusion in the main run of the weld. This apparent incomplete fusion is the result of transient conditions and should be considered acceptable. These brief transients affect only a very short portion of the weld and are not a cause for rejection because the main run of the weld is not affected. Measurements of incomplete fusion length should be rounded off to the nearest 1/8 inch.

A.3.4 Weld Cracks

1. Acceptance Criteria: The weld shall have no visible cracks.

2. Evaluation Guidelines: Visible weld cracks shall be identified for repair. If a weld with cracks is not repaired, it shall be considered ineffective in carrying load and an analysis of the connection shall be made on that basis. The use of devices for detection of cracks by visual examination is not required other than a flashlight.

A.3.5 Undercut

1. Acceptance Criteria: For material 3/8 inch and less nominal thickness, undercut depth of 1/32 inch on one side for the full length of the weld or 1/32 inch on one side for 1/2 the length of the weld and 1/16 inch for 1/4 the length of the weld on the same side of the member is acceptable. For members welded on both sides where undercut exists in the same plane of a member, the cumulative lengths of undercut shall be limited to the lengths of undercut allowed on one side. Melt-through that results in a hole in the base metal is unacceptable.

   For materials greater than 3/8 inch nominal thickness, undercut depth of 1/32 inch for the full length of the weld and 1/16 inch for 1/4 the length of the

weld on both sides of the member is acceptable. When either weld or undercut exist only on one side of the member or the undercut areas are not in the same plane, the allowable undercut depth of 1/32 inch may be increased to 1/16 inch for the full length of the weld.

2. Evaluation Guidelines: The criteria for determining the acceptance of undercut are depth and length. The method to be used for determining acceptable depths is primarily visual.

   Undercut depth is to be estimated to the nearest 1/32 inch and undercut length is to be estimated to determine compliance with the length of undercut criteria. There are significant margins in these criteria so that it is not necessary to sum isolated intermittent undercut (i.e. 1/4 inch here, 5/8 inch there) to develop the total length of undercut.

   Areas that potentially exceed the acceptance limits may be evaluated using a scale, comparative sample, or suitable gauge to determine the depth of undercut and assess the equivalent length and size of the weld.

A.3.6 Surface Porosity

1. Acceptance Criteria: Only surface porosity whose major surface dominion exceeds 1/16 inch shall be considered relevant. Fillet and groove welds that contain surface porosity shall be considered unacceptable if:

   The sum of diameters of random porosity exceeds 3/8 inch in any linear inch of weld or 3/4 inch in any 12 inches of welds; or four or more pores are aligned and the pores are separated by 1/16 inch or less, edge to edge.

2. Evaluation Guidelines: Porosity voids are generally less than 1/16 inch in diameter. Thus, relatively few are relevant. Very seldom should it be necessary to use any measuring device, but when there is concern, a 1/16 inch wire and a tape or scale are adequate.

   Estimating the number of random voids that appear to be over 1/16 inch diameter a 1/16 inch wire can be used to measure both the size of the pores and edge-to-edge spacing of the pores. If the size of a pore is 1/16 inch or less, it is irrelevant and need not be counted; if the spacing between any two relevant pores exceeds 1/16 inch, those pores are irrelevant for the purpose of evaluating aligned porosity.

Areas that potentially exceed the acceptance limits shall be evaluated to assess the equivalent length and size of the weld.

A.3.7 Weld Capacity

Weld overlap, underfilled craters, varied weld profiles are acceptable if the size and fusion requirements are met.

Welds that do not meet the size and fusion requirements or with visible discontinuities shall be recorded and evaluated to determine their equivalent size and length and recorded on Exhibit A-1.

A.3.8 Documentation

Form A-1 shall be prepared for each welded connection included in the weld verification program. These forms shall become part of the Phase II Walkdown Package.

Welding Verifier #1: _____ Date _____

Welding Verifier #1: _____ Date: _____

Procedure No. WDP-002, Rev. 1
APPENDIX A-1
Page 1 of 1
Sheet ____ of ____

WELD VERIFICATION DATA SHEET
WALKDOWN PACKAGE NO. _____

1. Connection Designation _____

2. Weld Identification and Location (circle as many as applicable)

		IDENTIFICATION	LOCATION		
a.	Clip angle to web weld	CAWW	T	S	B
b.	Clip angle outstd. leg weld	CAOW	T	S	B
c.	Seat angle beam weld	SABW	T	S	
d.	Seat angle outstd. leg weld	SAOW	T	S	
e.	Restraining angle to beam weld	RABW	T	S	B
f.	Restraining angle outstd. leg weld	RAOW	T	S	B
g.	Member or angle to embed weld	MAEW	T	S	B
h.	Other (describe)				

NOTE: T = TOP S = SIDE (S) B = BOTTOM

3. Weld Data

	CAWW	CAOW	SABW	SAOW	RABW	RAOW	MAEW
a. Size							
b. Shop (S) or Field (F) weld and indicate length from form J or K							
T							
S							
B							

4. Weld Irregularities (describe "N" responses)(attach description if necessary)

a. Free of visible cracks? (Y/N)							
b. Free of incomplete fusion? (Y/N)							
c. Free of other significant irregularities? (Y/N)							

5. Weld Derating:

Effective weld size/length	/	/	/	/	/	/	/