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AUTH.NAME AUTHOR AFFILIATION
RENBERGER,D.L. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards info re sacrificial shield wall corrective action plan.Design change does not require prior Ofc Nuclear Reactor Regulation approval as it is not unreviewed safety question & does not involve change in Tech Specs.

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Washington Public Power Supply System
A JOINT OPERATING AGENCY

P. O. Box 968 3000 Geo. Washington Way Richland, Washington 99352 Phone (509) 375-5000

G02-80-95
April 25, 1980

Docket No. 50-397

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20556

Attention: H. R. Denton, Director

Subject: WPPSS NUCLEAR PROJECT NO. 2
NRR APPROVAL OF WNP-2
SACRIFICIAL SHIELD WALL
WELD PREPARATION

Reference: WPPSS to NRC Region V letter, G02-80-79,
D. L. Renberger to R. H. Engelken, subject,
"Sacrificial Shield Wall (SSW) Corrective
Action Plan"

Dear Mr. Denton:

Based on discussions with NRC Region V, it is our understanding that the Headquarters of the Office of Inspection and Enforcement is requesting approval from NRR on the WPPSS corrective action plan for replacement of the slot welds by a circumferential, partial penetration weld for joining rings 3 and 4 of the Sacrificial Shield Wall (SSW) of our WPPSS Nuclear Plant No. 2 (WNP-2). This approval is considered necessary by I&E Headquarters before allowing WPPSS to proceed with the joint preparation for the partial penetration weld. Region V has indicated that I&E Headquarters is transmitting to you the information noted in the reference in parallel with this letter.

It is the opinion of WPPSS that this design change is not one requiring prior NRR approval, as it is not an unreviewed safety question and does not involve a change in the technical specifications. Also, in light of the fact that the operating license review for WNP-2 is still ongoing, any design changes will be appropriately documented in the FSAR for NRR review.

In any case, it is apparent that I&E Headquarters will be requesting prior NRR review and concurrence. Accordingly, we are submitting to you formally, on the docket, thirty copies of the reference information in

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order to expedite your review. The preparation of the joint and the subsequent related work is now or will shortly become critical path for the project construction schedule. Arrangements have been made for the welding machines, electrodes and preheat equipment. An expedited review and approval by NRR of the reference document is necessary to prevent further delay and impact on critical project work. WPPSS is prepared to meet with NRR at any time or place to discuss or present any of the material in order to expedite the review process.

It should be reiterated that your concurrence is being requested by I&E before joint preparation is being allowed to proceed. Accordingly, your review should be so oriented. The fundamental design reports for the Sacrificial Shield were subject to previous NRR review and approval as post-construction permit items. The background for this is documented in the response to NRC question 130.38 on the WNP-2 docket submitted formally to you in Amendment 8 to the FSAR in February.

Very truly yours,

D L Renberger

D. L. RENBERGER
Assistant Director
Technology

DLR:OKE:cph

cc: V. Stello - Director, NRC, Wash.D.C.
MD Lynch - NRC, Wash.D.C. (telecopy)
B. Wood - NUS
ND Lewis - EFSEC, Olympia, Wn.
JR Lewis - BPA
RE Snaith - B&R, New York
JJ Verderber - B&R, New York
JM Blas - B&R, New York
RC Root - B&R, Site
WNP-2 Files

STATE OF WASHINGTON)
) ss
COUNTY OF BENTON)

WPPSS NUCLEAR PROJECT NO. 2
SACRIFICIAL SHIELD WALL
WELD PREPARATION

D. L. RENBERGER, Being first duly sworn, deposes and says: That he is the Assistant Director, Technology, for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that he is authorized to submit the foregoing on behalf of said applicant; that he has read the foregoing and knows the contents thereof; and believes the same to be true to the best of his knowledge.

DATED April 24, 1980

D L Renberger
D. L. RENBERGER

On this day personally appeared before me D. L. RENBERGER to me known to be the individual who executed the foregoing instrument and acknowledged that he signed the same as his free act and deed for the uses and purposes therein mentioned.

GIVEN under my hand and seal this 24th day of April, 1980

Reba B. Helgeson
Notary Public in and for the State of Washington
Residing at Richland

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THIS LETTER SATISFIES COMMITMENT NO. _____

THIS LETTER (DOES) (DOES NOT) ESTABLISH A NEW COMMITMENT.

WPPSS CORRESPONDENCE NO. _____

TELECOPY

Docket No. 50-397

G02-80-79
March 25, 1980

Mr. R. H. Engelken, Director
NRC Region V
Suite 202, Walnut Creek Plaza
1990 N. California Boulevard
Walnut Creek, California 94596

Subject: WPPSS NUCLEAR PROJECT NO. 2
DOCKET NUMBER 50-397
SACRIFICIAL SHIELD WALL (SSW)
CORRECTIVE ACTION PLAN

Reference: NRC Region V Letter, R. H. Engelken to N. O. Strand, WNP-2 Pipe Whip Restraints and Sacrificial Shield Wall, dated February 8, 1980

Dear Mr. Engelken:

The corrective action plan for the sacrificial shield wall (SSW) has been finalized. It consists of providing justification for the slot weld replacement by the partial penetration weld, performing a welding defect/structural impact assessment to evaluate the SSW as-built structural capabilities, selection and qualification of the shield material for shim gaps and concrete voids, and a final report at a later date discussing all items of concern on a case-by-case basis.

The interim welding defect/structural assessment is being performed in a conservative, bounding manner with the following considerations:

- Welding defects identified by the recent Burns and Roe SSW visual inspection of 100% of accessible welds,
- Welding defects identified by magnetic particle examinations performed on the SSW by site contractors,
- Welding defects identified by ultrasonic examinations performed on the SSW by site contractors and Leckenby,
- The SSW welding defect and repair history experienced by Leckenby during fabrication,

dupe
8004073 67

AUTHOR:	DC Timmins DC Timmins 3/21/80	FOR SIGNATURE OF:	DL Renberger D L Renberger		
SECTION					
FOR APPROVAL OF	RM Foley	GT Harper	RT Johnson	WC Bibb	ME Witherspoon
APPROVED		GT Harper	RT Johnson		MEW
DATE		3/21/80	3-21-80	3/21/80	3/24/80

WP-397

- Assessment of Leckenby NDE credibility, welding procedures and welder qualifications/capabilities,
- Lamellar tearing,
- The use of cold forming and heat straightening processes during SSW fabrication,
- SSW as-built dimension considerations with respect to the partial penetration weld at El. 541'-5", and
- The impact of the known welding defects and defect history and their extrapolation to the remainder of the SSW in conjunction with other welding related concerns mentioned above on the SSW functional capabilities.

This technical evaluation will establish the SSW acceptability as-is with appropriate justification or will identify corrective action/ repair as necessary. This evaluation will be performed in a typical engineering manner, i.e., independent checking of the technical results.

The replacement of the slot welds by the partial penetration weld at El. 541'-5" is considered to be an equal and alternate method of achieving the horizontal shear design requirements. We do not view it as a change in design requiring prior NRC approval in that it is not an unreviewed safety question or change in technical specifications.

Attachment 1, Burns and Roe Technical Memorandum No. 1173, provides justification for the use of the partial penetration weld between SSW rings 3 and 4 including SSW as-built dimension considerations. Attachments 2, 3, 4 and 5 provide details for the joint preparation and welding of the partial penetration weld. The preparation of this joint will provide additional information about the material in this area of the SSW; it does not preclude any investigative work.

Considering the above and the reference, it is requested that the Supply System at this time be allowed to commence preparation of the joint for the weld joining SSW rings 3 and 4.

A subsequent letter to NRC Region V will specifically address the proposed shield material and request your concurrence to proceed with shim gap shielding repair and welding of rings 3 and 4.

Very truly yours,

D L Renberger

D. L. Renberger
Assistant Director,
Technology

DLR:DCT:der

Attachments:
(1) Burns and Roe Technical Memorandum No. 1173, dated March 19, 1980
(2) Project Engineering Directive (PED) No. 215-W-1604
(3) PED No. 215-CS-2741
(4) PED No. 215-W-2742
(5) PED No. 215-W-2749

cc w/att: V. Stello, NRC
N.D. Lewis, EFSEC, Olympia
J.R. Lewis, BPA
J.J. Verderber, B&R N.Y.
R.C. Root, B&R Site
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TECHNICAL MEMORANDUM

DATE 3/19/80

COPIES TO:
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TO R. E. Snaith

FROM M. N. Fialkow

SUBJECT W. O. 2808
Washington Public Power Supply System
WPPSS Nuclear Project No. 2
Sacrificial Shield Wall - Assessment Program
Connection of Upper and Lower Wall Segments
TECHNICAL MEMORANDUM NO. 1173

REFERENCES:

1. NRC Letter from R. H. Engelken to N. O. Strand dated 2/8/80, Subject: Washington Nuclear Project No. 2, Pipe Whip Restraints and Sacrificial Shield Wall.

2. WPPSS Letter WPBR-80-96 from R. M. Foley to J. J. Verderber, dated 3/6/80, Subject: WPPSS Nuclear Project No. 2, Sacrificial Shield Wall (SSW) Assessment Program.

3. Calculation No. 6.19.37, Book No. SV 489 Pages 45 - 61 Title: WPPSS-Hanford No. 2 - Reactor Bldg. - Sacrificial Shield Wall, Subject: Correction Measures at Interface El. 541'-5".

4. Washington Public Power Supply System Nuclear Project No. 2 Report No. WPPSS-74-2-R2-B, "Sacrificial Shield Wall Design Supplemental Information".

5. ASCE Manual No. 41, "Plastic Design in Steel", 2nd Edition, 1971, Chapter 10: Multistory Frames, pp. 246-247: PΔ Effects.

INTRODUCTION:

It has been determined that the horizontal rings in the Sacrificial Shield Wall (SSW), located above and below the interface at Elevation 541'-5", are not welded together as shown on the contract drawings. Correction measures to transmit the design horizontal shear between the channel ring above the interface and the box ring below the interface are required.

The contract requires that at each of 24 locations around the SSW, four slot welds are to be provided in the web of the upper channel ring connecting to the lower box ring. In lieu of this unfulfilled requirement, it is proposed to install a partial penetration groove weld along the exterior circumference between the two rings.

Structural analysis in justification of the proposed correction has been accomplished (Reference 3). This memorandum furnishes pertinent information relative to this analysis in compliance with letters from USNRC and WPPSS (References 1, 2). The following is included:

a. Description of correction weld
b. Design considerations
c. Analysis based on the design SSW configuration
d. Analysis for as-built SSW dimensions.

DESCRIPTION OF CORRECTION WELD

The correction weld is a partial penetration groove weld with fillet weld reinforcement to be installed along the exterior circumference between the rings above and below the interface at Elevation 541'-5". The location and extent of the weld are shown in Figure 1; weld details are shown in Figure 2.

As shown in the figures, the correction weld is to be installed in each of the 24 panels around the SSW for the width available between the column splice plates. Preparation for the groove weld requires removal of material from the channel ring. The specific configuration of the weld in each panel, including the groove depth and the size of the fillet weld reinforcement, depends on the width of ledge at the interface. From the design viewpoint, a minimum overall weld depth of 2 inches, corresponding to an effective weld throat of 1 7/8 inches, is maintained in all configurations.

DESIGN CONSIDERATIONS FOR CORRECTION WELD

1. Basic Data

The analysis and design of the proposed correction weld utilizes the values of the stress resultants in the members and skin plates obtained in the analysis of the overall sacrificial shield wall. A description of the analysis and design of the SSW including loads, load combinations, and acceptance criteria was submitted to NRC by Report No. WPPSS-74-2-R2-B (Reference 4) and approved by NRC by letter dated October 15, 1975.

The analysis and design of the correction weld is in conformance with NRC Standard Review Plan (SRP) 3.8.3. In particular, requirements relative to loads, load combinations, and acceptance criteria are complied with. The basis of design is the elastic working stress method, Part 1 of the 1969 AISC design specification.

2. Significant Loads

The following significant loads, considered in the analysis and design of the sacrificial shield wall, are applicable to the correction measures:

Dead and live loads
Seismic loads: OBE and SSE
Pressurization of the annulus between RPV and SSW
Reactions due to pipe break

Annulus pressurizations include those due to postulated pipe breaks in the following lines:

Recirculation outlet lines
Recirculation inlet lines
Feedwater lines
RHR/LPCI lines

Pipe break reactions include those due to the preceding breaks and due to other severe postulated breaks occurring in the drywell proper. Ten controlling breaks in the drywell are included.

3. Controlling Loading and Load Combination

The significant loads are considered in the load combinations of SRP 3.8.3 with regard to horizontal loads at the interface. The controlling loading with associated acceptance criteria with regard to horizontal loading per panel is noted below:

SRP Combination 5: $1.6S \geq D + L + P_a + Y_r + E$

D, L: dead, live load

P_a: annulus pressure due to break in feedwater line at azimuth 90°.

Y_r: pipe reaction due to the feedwater line break

E: combined effect (by SRSS) due to OBE seismic events in the easterly, northerly, and vertical directions.

ANALYSIS BASED ON DESIGN SSW CONFIGURATION

1. Design Concept

The correction weld carries the horizontal shear loads which are transmitted between the ring channel above the interface and the ring box member below the interface. The horizontal loads from the channel are due to horizontal reactions from the skin plates and columns which connect to the channel from above. Reactions from the analysis of the SSW in its design configuration are used. The shear loads from the skin plates are tangential (circumferential) in direction. Shear loads from the columns have tangential and radial components. The connection design is based on the largest combined shear load in any one panel due to the associated skin plates and columns. The same correction is applied to all panels.

2. Design Loads

The largest combination of shear loads per panel in the controlling load combination 5 has magnitudes as listed below:

Skin plates:	Tangential shear	= 318.1 kips
Column:	Tangential shear	= 8.9 kips
	Radial shear	= 27.4 kips

The total panel tangential shear, 327.0 kips, is taken to act with half applied along each flange of the ring channel. The total panel radial shear, 27.4 kips, is taken to act along the line of the column web.

3. Weld Design Criteria

Welding procedures will be qualified in accordance with the requirements of the Structural Welding Code AWSD1.1. Weld design is based on allowable stresses associated with partial penetration groove welds.

4. Correction Weld Stress Analysis

The panel design loads result in tangential and radial shear resisting forces in the panel correction weld. The total panel tangential load causes a uniform tangential force in the weld of 9.9 kips per inch. A radial weld force which varies linearly between extreme values at the ends of the weld resists the moment on the weld due

to the eccentricity of the applied tangential load along the interior face; the maximum value of this radial force is 21.6 kips per inch. An additional radial weld force with constant magnitude equal to 2.7 kips per inch acts over a limited portion of the weld near its end to resist the applied radial load along the column web line. The maximum value of the resultant weld force occurs at the end of the weld and is equal to 26.3 kips per inch.

5. Controlling Design Margin

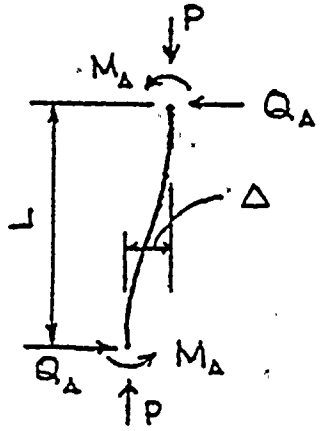
The design margin, which is the ratio of the permissible stress to the actual stress, equals 2.3 for the above maximum value of the weld force.

ANALYSIS FOR AS-BUILT SSW DIMENSIONS

1. Concept for Analysis

As-built deviations of the SSW which affect the proposed correction weld at interface Elevation 541'-5" are illustrated in Figure 3. As shown in the figure, the deviations from verticality of the columns above the interface and the deviations from the design circularity of the ring channel members above the interface are involved.

The lateral displacement of one end of a member, Δ, relative to the other end in conjunction with the primary axial load in the member, P, results in additional (secondary) shears and moments in the member (reference 5). This PΔ effect with the associated end bending moments and shears is shown below:



From equilibrium considerations, it is determined that:

$$P\Delta = Q_\Delta L + 2M_\Delta$$

Conservatively, the additional end moment M_Δ and the additional end shear Q_Δ are each evaluated as though the other is non-existent. This is done in the following equations.

$$M_\Delta = .5 P\Delta$$

$$Q_\Delta = P\Delta/L$$

2. Design Loads

The controlling axial loads in the columns and ring channels are due to the same applied loads taken in SRP Combination 5 which control for the transmission of shear across the interface. The axial force in the ring channel is taken equal to the design panel tangential shear of 327.0 kips. The axial force in the column is taken as the total panel vertical load due to both column and skin plate reactions. Conservatively, the maximum vertical loads in the column and skin plates are used even though these are not located in the same panel as the panel which controls for shear. The design vertical axial load is 316.5 kips.

3. Effect on Annulus Pressurization

With respect to the effect of as-built SSW dimensions on annulus pressurization calculations, the following is noted:

a. The measurements of concern apply to the annulus space between the sacrificial shield wall and the reflective insulation. These measurements are very difficult to obtain and are not available. However, it is noted that the insulation support system is mounted on the SSW so that the dimension between insulation and wall would tend to be unaffected by the as-built deviations.

b. For the design of the wall, NRC required that calculated annulus pressurization loads be increased by 40 percent. One of the reasons for this requirement was to account for as-built conditions being different from the conditions assumed in the analysis.

4. Magnitude of As-Built Deviations

The as-built deviations used in the analysis are based on the most conservative interpretation of the revised erection tolerances which were adopted for the erection of the SSW together with a supplementary field check of the deviations.

Prior to erection of the wall, the contractor requested and was granted relaxation of the original contract requirements on erection tolerances. The maximum permissible deviation from circularity was changed to $\pm$ 0.90 inches in lieu of the original $\pm$ 0.125 inches. The maximum horizontal deviation at the top of the wall from the vertical line through the corresponding point in the base of the wall was revised to $\pm$ 0.90 inches in lieu of the original $\pm$ 0.25 inches.

The most conservative interpretation of the adopted tolerances results in the deviation values noted below. These values are used in the analysis.

a. Circularity - The maximum tolerance is taken to occur at one column relative to the adjacent columns on either side.
Referring to Figure 3,

$$\Delta_{Ci} - \Delta_{C,i+1} = \Delta_{Ci} - \Delta_{C,i-1} = 0.90 - (-0.90) = 1.80 \text{ inches}.$$

b. Verticality - The maximum tolerance is taken to occur at a column between Elevation 541'-5" and Elevation 549'-5½". Using the terminology of Figure 3,

$$\Delta_V = 0.90 - (-0.90) = 1.80 \text{ inches}.$$

Field measurements pertinent to the vertical and circular deviations have recently been made. The magnitudes of Δ_V as defined in Figure 3 were determined around the shield wall. However, precise determination of the circular deviation is not practical due to interference of existing construction. As a measure of the circular deviation, the radial deviation between the ring box member below the interface and the ring channel above the interface is used.

Comparison of the deviations from field measurements with those based on the tolerances makes apparent the conservative basis of the analysis. Thus the analysis uses $\Delta_V = 1.8$ inches compared to a maximum measured value of 0.625 inches. Also, the analysis uses $\Delta_{Ri} - \Delta_{R,i+1} = 1.8$ inches compared to a corresponding value of 0.875 inches based on field data.

5. Correction Weld Stress Analysis

As noted in the Concept for Analysis, the design axial loads acting with the adopted design deviations result in additional end moments and shears in the columns and ring channels located above the interface.

The additional end moments in the column and ring channel are 285.0 inch kips and 294.3 inch kips respectively. The associated increases in flexural stress in the members are less than 0.7 kips per square inch. This increase in stress is relatively small and is within the capacity of the wall members.

The additional column radial shear is 5.9 kips. The additional radial shear in each of the two ring members at the column is 13.4 kips. Thus, a total of 32.7 kips of additional radial shear results due to the design deviations. Conservatively, this additional radial shear is taken to occur in the controlling panel used for the design of the correction weld. The total panel radial shear is increased to 60.1 kips and the resulting local radial weld force increases to 6.0 kips per inch from the previous value of 2.7 kips per inch in the Analysis Based on Design SSW Configuration.

6. Design Margin

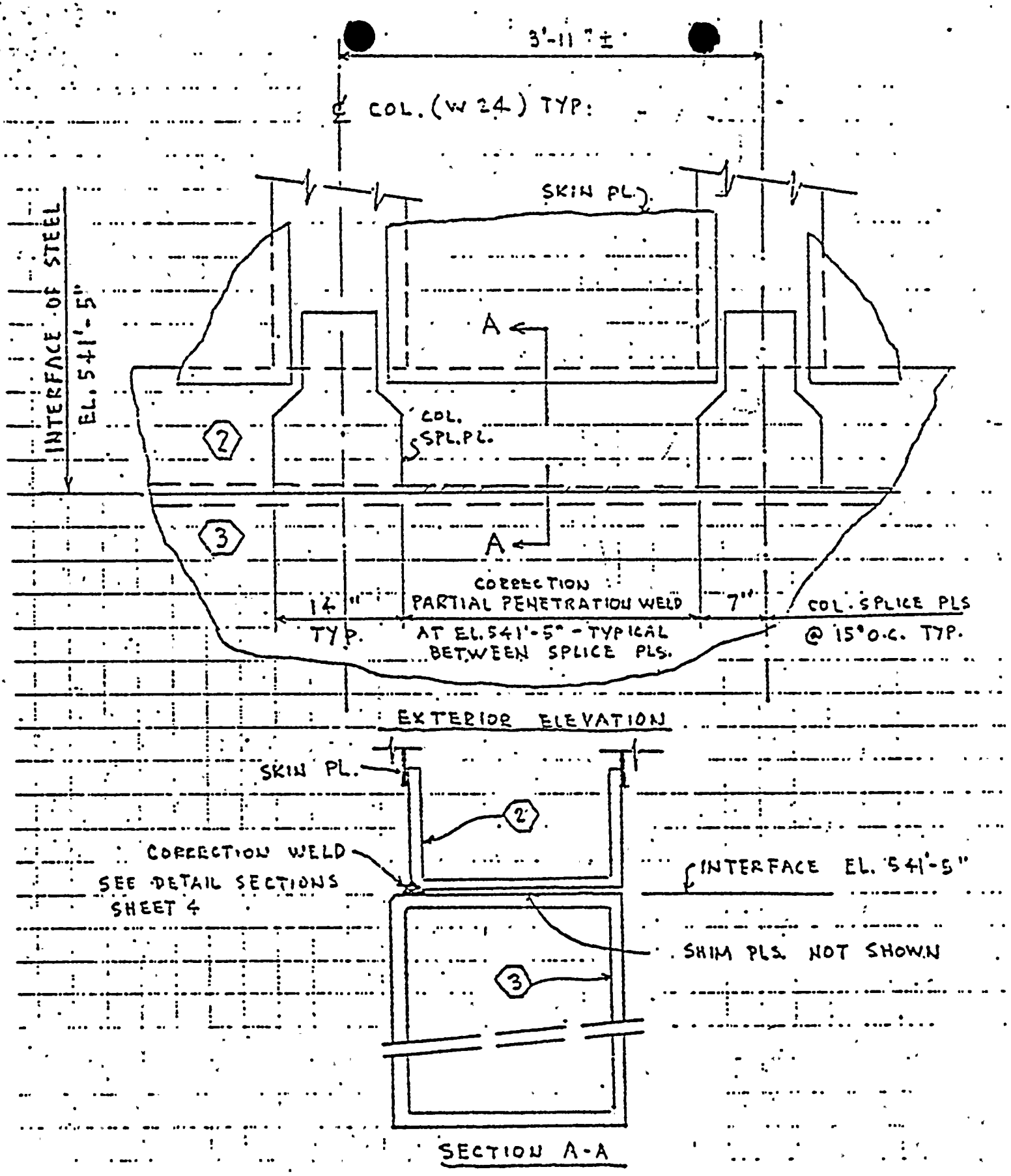
With the above increase in panel radial shear, the design margin is 2.1 as compared to the previous value of 2.3.

CONCLUSION

Based on the preceeding analysis, the proposed correction weld at interface Elevation 541'-5" has sufficient capacity to sustain the required loads. The correction provides a design margin in excess of 2.1.

Prepared by: M. N. Fialkow
M.N. Fialkow

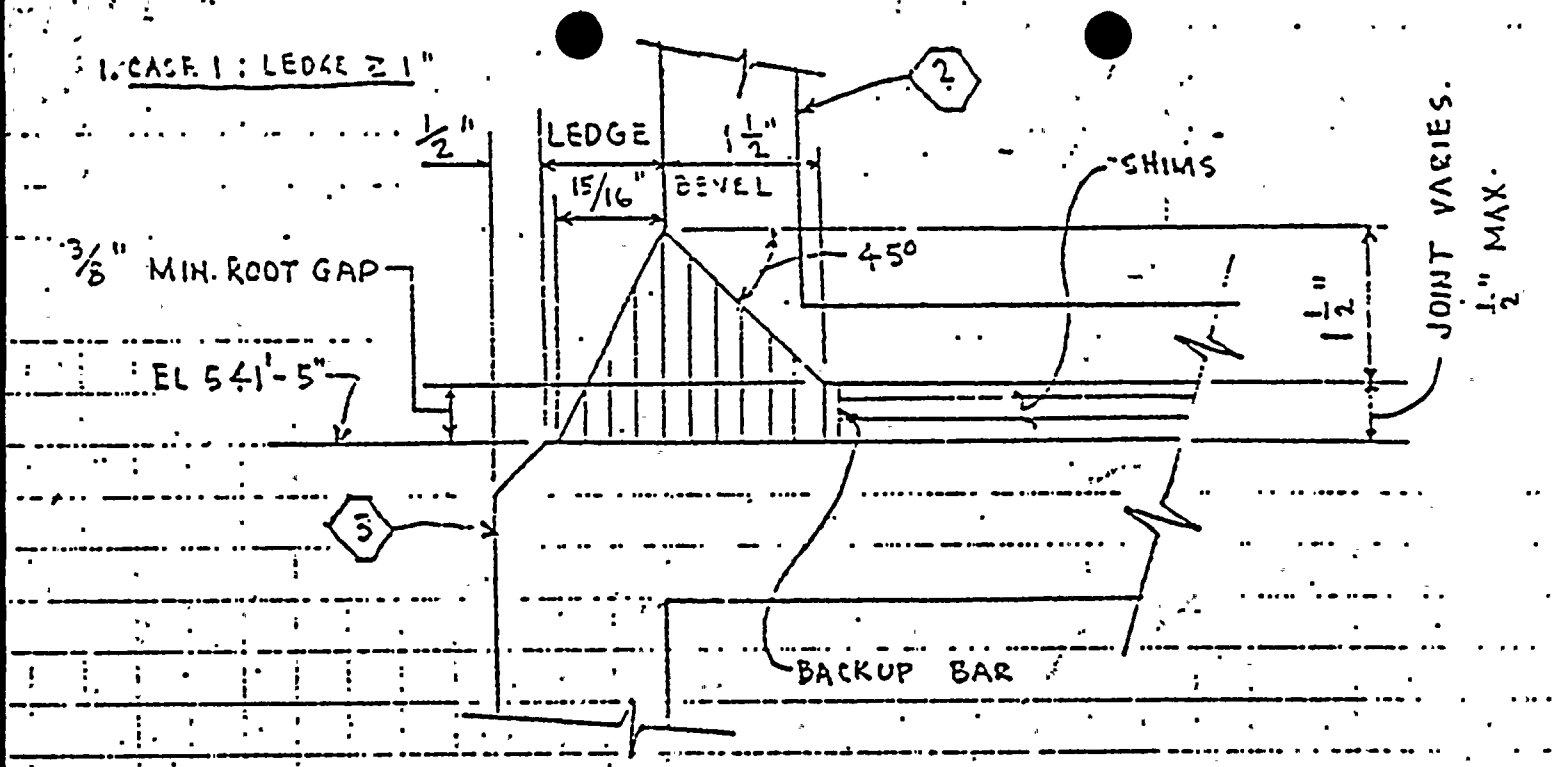
Approved by: J. F. O'Donnell
J. F. O'Donnell



ELEVATION AND SECTION OF SSW SHOWING CORRECTION WELD

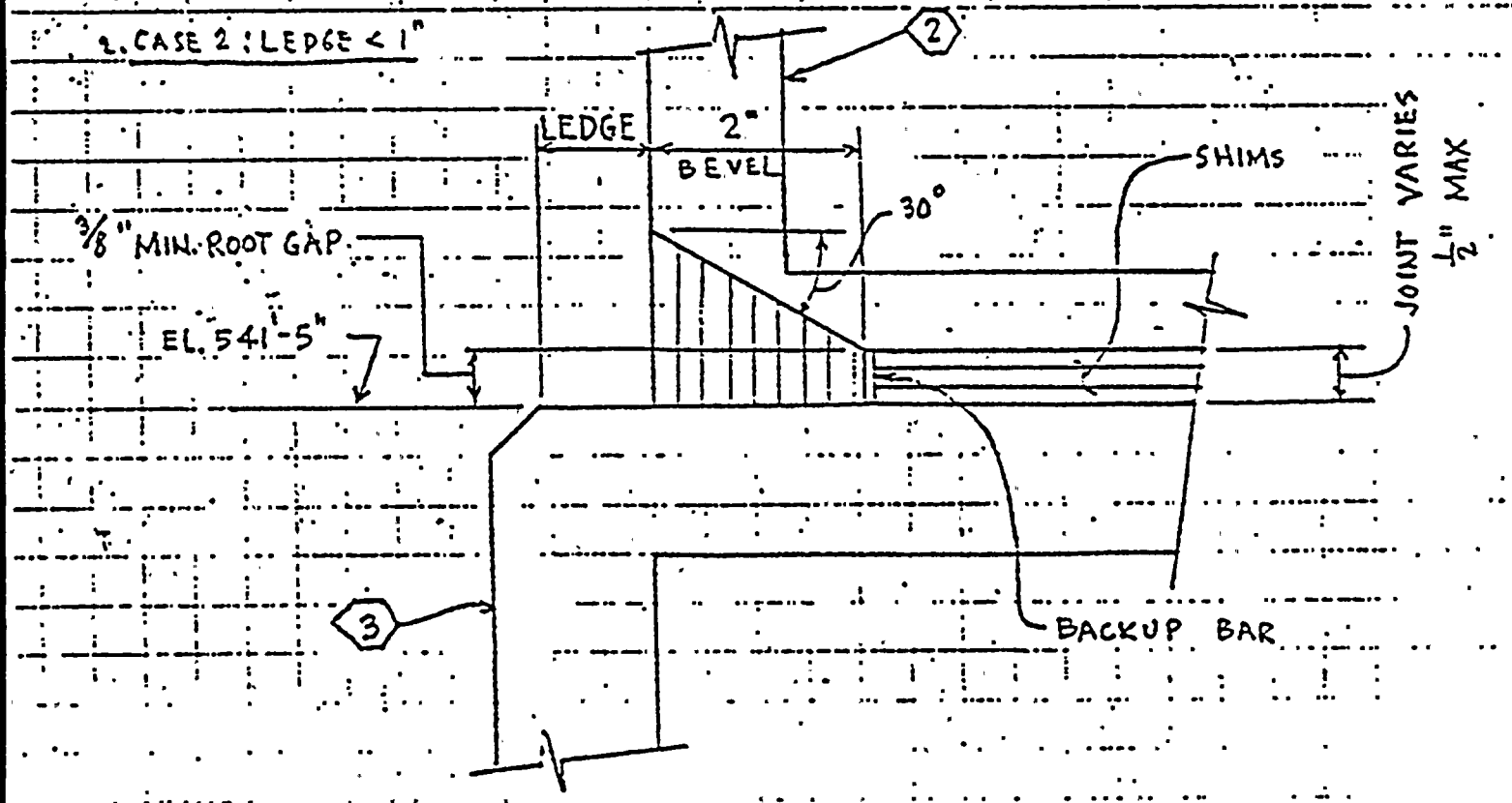
FIGURE 1

1. CASE 1 : LEDGE ≥ 1"



SECTION WHERE LEDGE IS A MINIMUM OF 1" WIDE

2. CASE 2 : LEDGE < 1"



SECTION WHERE LEDGE IS LESS THAN 1" WIDE

REINFORCING FILLET TO BE ADDED AS SHOWN ON SHEET 5 OF PED-215-CS-2741.

DCJ 3/24/80

CORRECTION WELD DETAILS

FIGURE 2

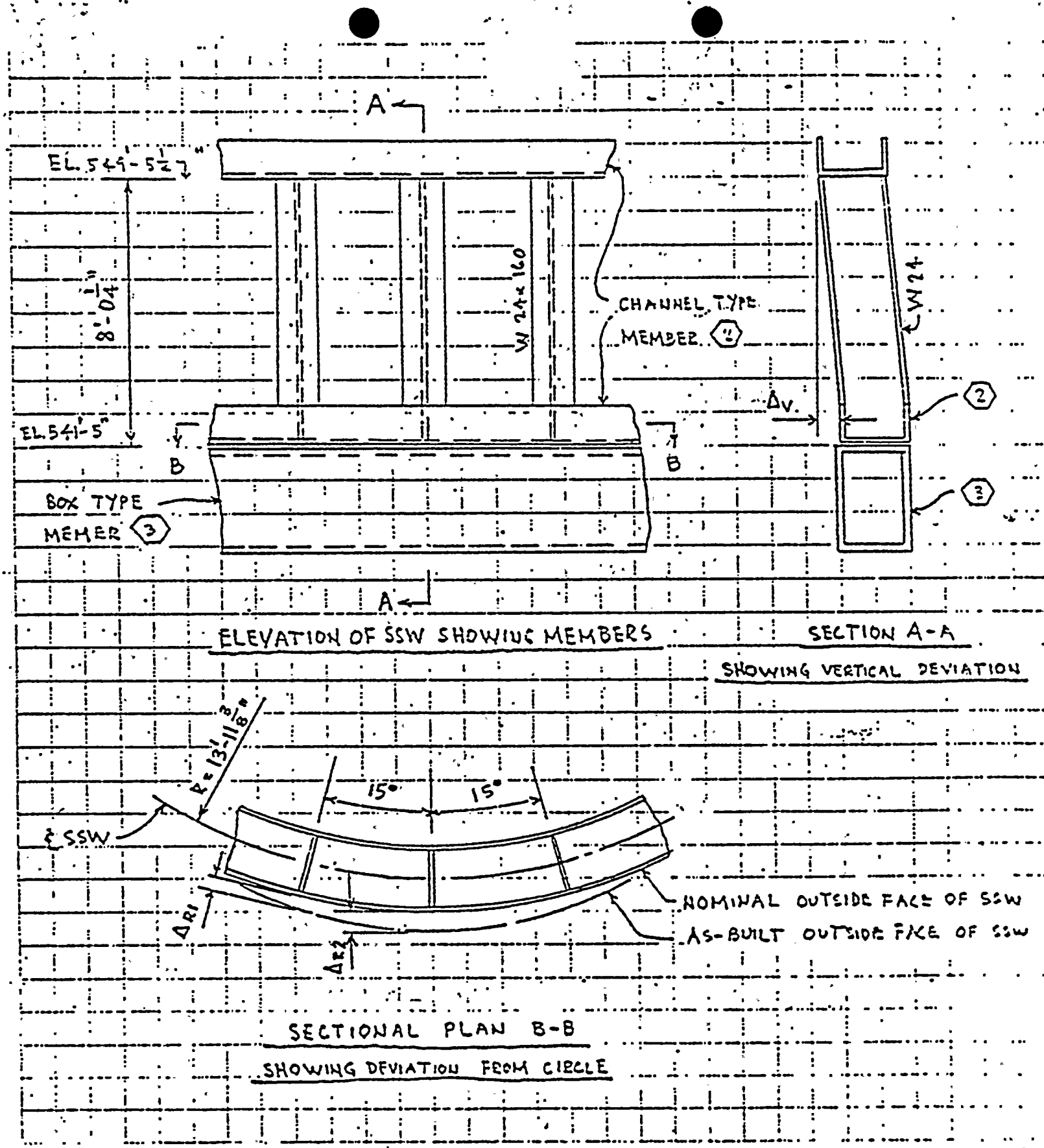


DIAGRAM ILLUSTRATING AS-BUILT DEVIATIONS

FIGURE 3

BURNS AND ROE, INC.
WPPSS
NUCLEAR PROJECT
NO. 2

PROJECT
ENGINEERING
DIRECTIVE

CODE	PROJECT ENGINEERING DIRECTIVE														
2			2	1	5		-	W		-	1	6	0	4	
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15		
DATE	1	0	/	2	4	/	7	9		PRIORITY					
X	16	17	X	18	19	X	20	21		I					

REASON FOR P. E. D.:

Slot welds required per detail D 2038 (S782) made to top of shims and do not connect ring 3 (Beam type 3) and ring 4 (Beam type 2) as required.

INFORMATION COPIES

SHEET 1 OF 15

REFERENCES
SUBJECT Sac. Shield Wall Welds
LOCATION El. 541'-5" All A
ENG. SYSTEM N/A
S/U SYSTEM
QUALITY CLASS

ORIGINATING DOCUMENTS NCR 215-5688

DESCRIPTION OF WORK:

Replace slot welds with a partial penetration weld between the upper and lower rings as shown on attached details with FCAW process being used for complete joint welding except for buttering that is required with SMAW E7018 .

All welding is to be performed per direction of Burns and Roe Welding Engineers, Addenda System and this PED which includes a work procedure with buttering, peening, grinding, visual inspection, MT inspection and a sequence.

NOTES

1. THIS PED REVISES DIRECTION PREVIOUSLY PROVIDED BY THE FOLLOWING PED(s): N/A
2. THIS PED VOIDS DIRECTION PREVIOUSLY PROVIDED BY THE FOLLOWING PED(s): N/A
3. THIS PED WORK SHOULD BE COORDINATED WITH KNOWN OTHER WORK UNDER THE FOLLOWING PED'S: N/A
4. THIS PED DEPENDS ON THE PRIOR INSTALLATION OF THE FOLLOWING PED'S: N/A

REVISE:

NONE
DRAWINGS N/A
SPECIFICATION

APPROVALS:

M Gotham	3-24-80
DISCIPLINE ENGINEER	DATE
L F Allen	3-25-80
LEAD DISCIPLINE ENGINEER	DATE
S/U LIAISON ENGINEER	DATE
RESIDENT PROJECT ENGINEER	DATE

REV 1 BR 803-2

dupe of 8004070370

REPAIR PROCEDURE FOR NCR #05688 AT THE
541'-5" LEVEL IN REACTOR CONTAINMENT VESSEL

1) PURPOSE

The purpose of this procedure is to establish the requirements for the structural steel repair welding inside the containment. Any deviation from the requirements of this procedure will require specific approval of the Burns and Roe Welding Engineer. Deviation approvals will be granted only after examination of the problem areas and a resolution given by Burns and Roe Welding Engineer by Addendum system.

Welding sequences shall be issued as attachments to this procedure. Any changes or additions to weld sequences or other special instructions shall require approval by the Burns and Roe Welding Engineer.

The Quality Control Manager shall be responsible for assuring compliance with these procedures.

2) DOCUMENTATION

Work packages shall be used for all structural steel work and shall be prepared in accordance with this procedure.

The Structural Steel Weld Record form shall be used for structural steel welding documentation.

Weld repairs, if required, shall be documented on the Structural Steel Weld Repair forms.

The loss of Preheat/Interruption of Weld Sequence form shall be used to document such occurences. If cracks are discovered, an Inspection Report will also be initiated. Upon completion of the form, a copy will also be immediately given to Burns and Roe Welding Engineer on duty for approval.

Preheat recorder charts shall be identified by weld, iso., or dwg. no., and transmitted, upon completion of work, to the Q.A. vault.

3) MATERIAL

Electrode Control shall be in accordance with the work procedure. Electrodes shall be purchased in hermetically sealed containers and shall be dried for at least one(1) hour at temperatures between 750°F. and 800°F. prior to issuance. Electrodes shall be maintained at a minimum temperature of 250°F. after the high temperature bake until withdrawn for use or temporary storage in portable ovens or a storage oven conveniently placed near the work area. Electrodes shall be removed from portable ovens one at a time and used immediately. Electrodes that have been or are wet shall be bent and discarded in an approved container. (Note: FCAW wire does not require pre-baking).

REF. DOC PCN ~~REF SPEC SECTION: PAGE PARA~~		RFT NCR 215-5688	WPPSS NUCLEAR PROJECT NO. 2 BURNS AND ROE, INC.
REF DWG.	DWG ZONE:		PED 215-W-1604 SHT 2 OF 15
SCALE	DRAWN BY DATE CHKD DATE	REVIEWED: DATE 3-24-88	TITLE: Weld Work Procedure

4) WELDER QUALIFICATIONS

All welders using this procedure shall be qualified to unlimited thickness and all positions in accordance with approved weld procedures and AWS D1.1.

Welders qualified by groove welds on 8" sched. 120 pipe or larger and on plates 1" or over are qualified for all thicknesses of structrual steel

5) PROCEDURE

PREHEAT PROCEDURE AND REQUIREMENTS

The following material shall be on hand prior to preheat and welding operations:

a) Heating torches
b) Heating coils or blankets
c) Heat retaining blankets
d) Clips for holding coils, blankets, etc., in place.
e) Temperature control and recording equipment.

6) TORCH HEATING

1) Torches may be used for applications involving arc-air gouging, attaching strongbacks, heater blanket clips, tacking, backing bars, and minor repairs. Preheat shall be 200°F.± 25°F. with a 15 minute soak time.
2) Heating torches may be used to locally preheat the structure and weld site in the areas to be tack welded.
3) Heating torches shall be used with a neutral flame.
4) When preheat is obtained through torch heating for other than temporary tack welds, Q.C. shall frequently monitor the site both prior to and during welding to assure that minimum preheat and maximum interpass temperature requirements are maintained.

~~REF DOC REV~~	~~REF~~ NCR 215-568	WPPSS NUCLEAR PROJECT NO. 2
~~REF SPEC SECTION~~ ~~PAGE~~	~~PARA~~	BURNS AND ROE, INC.
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SCALE / DRAWN BY / DATE	REVIEWED MB DATE 3/10/84	TITLE: Weld Work Procedure

7) RESISTANCE HEATING

All areas to be preheated, except those specifically exempted by the Burns and Roe Welding Engineer, shall be preheated using electric heating elements. The precise locations of the heaters will be designated by the preheating contractor's welding engineer.

Strip chart records of weld joint preheat and cool down are required.

Only magnetic holders shall be used to hold heaters and blankets to the Sacrificial Wall and to structures on the 541' level.

The preheat and maximum interpass temperature shall be held from the center line of the joint outward to at least 3" on each side of the joint. More than 3" from the joint the temperature range may be less than the minimum specified but shall not be more than the maximum specified. Thermocouples shall be located no more than 3" from the weld center line and their placement requires approval by the Burns and Roe Welding Engineers.

Inspectors shall check preheat with a contact pyrometer at fit-up before allowing welding to begin. During welding, inspection shall monitor minimum preheat and maximum interpass temperatures in the joint using a contact pyrometer.

After reaching preheat temperature, soak the joint at temperature for 1½ hours before beginning welding. Maintain the temperature range until all welding has been completed and then soak for another three (3) hours before starting cool-down.

Heat retaining blankets shall be used as necessary to control cool-down rate. The cool-down rate shall not exceed 50°F. per hour. Blankets may be removed when ambient temperature has been reached.

The heat retaining blankets, which must be maintained throughout preheat, all welding inspection, and cool-down, may be adjusted to permit welding. For instance, a heater and blanket may be placed directly over the joint for preheat and soak, then removed during welding.

When the preheat drops below the specified minimum, a Loss of Preheat form shall be prepared. The temperature shall be restored as soon as possible after the low temperature is detected.

8) TEMPERATURE REQUIREMENTS

The preheat requirement for local torch heating for attaching strongbacks, heater blanket clips, backing bars, and for tacking shall

be: 150°F. to 200°F. for at least 2" in each direction from the weld site, with a 15 minute soak time at temperature prior to beginning work.

Welders and/or operators shall be provided temperature indicating crayons or contact pyrometers to assure that preheat requirements are being met.

9)

	PREHEAT	MAXIMUM INTERPASS TEMPERATURE
Welds to Sacrificial Shield Wall and within 24" of the Sacrificial Shield Wall.	200 ± 25°F.	250°F.

The minimum preheat and maximum interpass temperature for all welding shall be as noted above.

10) FIT-UP AND TACKING

The joint gap for structural and partial penetration welds shall not exceed 3/16" for material thicknesses less than 3". The joint gap shall not exceed 5/16" for material thicknesses 3" and above. Such joints shall incorporate adequate backing against which to weld.

The root opening for single bevel grooves against backing bars shall be as follows.

1/4" min. to 9/16" max. backing bar removed after welding.
3/8" min. to 9/16" max. backing bar left on.

Tack welds shall be subject to the same quality requirements as the final welds except that discontinuities such as undercut and unfilled craters need not be removed before the final arc weld.

Preheat is mandatory for single pass tack welds which are remelted and incorporated into continuous arc welds (final welds).

Tack welds must be large enough to prevent shifting or cracking during subsequent welding. They must be clean, contain no cracks, lack of fusion, or slag and should be designed to become part of the final weld.

Tack welds which are incorporated into the final welds shall be made with electrodes meeting the requirements of the final welds and shall be cleaned thoroughly.

Welding

11) All welding shall be performed using approved welding procedure according to AWS D1.1 and Specification Section 2808-215-17D. A stringer bead technique shall be used to the greatest extent possible. In any case, the width of bead shall not exceed three (3) core diameters of the electrode (except for dual shield flux cored wire which shall not exceed 3/8" in width.

The minimum size of a root pass shall be sufficient to prevent cracking and the maximum thickness of layers subsequent to root pass shall be 1/8" for welds made in the flat position and 3/16" for welds made in any other position.

Each weld pass of deposited weld metal shall be thoroughly cleaned using slagging picks, wire brushes, or by grinding.

Any cracks, blow holes, or other defects that appear on the surface of weld beads shall be removed by chipping or grinding before the next covering weld bead is deposited.

All weld beads, except those in the root and final layers, shall be peened immediately after removal of slag. However, any visible defects such as porosity, cracks, or slag pockets must be removed by grinding prior to peening. Peening shall be done using an air hammer with a round nose tool of a minimum diameter of one quarter inch (¼"). Peening shall be done in a straight and continuous line. Care shall be exercised to prevent scaling or flaking of weld base metal from over-peening. Peening shall be used in all cases, except where specifically prohibited by a note on the weld sequence sheet. Air operated "needle" slagging guns shall not be used for peening purposes. Peen per shetch attached.

No downhill welding will be permitted.

Heat input range shall not exceed the following:

35kj/in. heat input shall be maximum for welding.

Buttering may be done horizontally, vertically (up), or any combination of the two. Requirements for buttering, if any, are shown on weld sequence sheet. Buttering does not require peening.

All groove welds and all fillet welds against the Sac. Wall require that the Sac Wall be buttered, and the I.D. of all weld joints shall be buttered prior to welding.

~~REF. DOC. FOR~~ REF. NCR 215-5688		WPPSS NUCLEAR PROJECT NO. 2
~~REF. SPEC. SECTION~~	~~PAGE~~	BURNS AND ROE, INC.
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SCALE	DRAWN BY	DATE	REVIEWED	DATE	TITLE:
~~SPEC.~~	~~DATE~~	~~APPROVED~~		~~DATE~~	Weld Work Procedure

Every effort should be made to provide continuous welding until the joint is complete. As a minimum, for base material thickness up through 2½", 3/4" throat thickness shall be obtained without an interruption. For material thicker than 2½", 1½" throat thickness should be completed without interruptions. "Interruptions" shall be defined as welding which is discontinued for more than 1 hour but less than 2 hours. All "interruptions" shall be recorded. Any weld which is discontinued for more than 1 hour must be dispositioned and approved by the Burns and Roe Welding Engineer. Any weld which exceeds the 2 hour interruption limit shall require documentation on an IR/NCR if deemed necessary by the Burns and Roe Welding Engineer. For all interruptions, the following action shall be taken:

1) The last weld layer shall be peened before the weld is left.

2) The weld shall be covered with insulation blankets and the required preheat maintained. Q.C. shall verify this.

3) The weld shall be visual inspected prior to resuming welding. The visual inspection report noting the interruption shall be included in the work package. If a crack is discovered, an IR shall be prepared.

4) Each weld shall be peened and inspected, per attached sketch.

12) INSPECTION

Prior to any welding, the area to be welded shall be visual inspected in accordance with AWS D1.1, and after any arc-gouging, cutting or grinding. All welding shall be MT inspected at 100% completion at preheat temperature. All welding shall be MT inspected 72 hours after cool down.

When the finished weld will be inaccessible for the 72 hour magnetic particle inspection because another weld or member will have covered it, acceptance will be based on a hot MT made when the weld is complete and visual and 72 hour MT of any remaining exposed areas. This exception is only allowed when it eliminates heat cycling a weld zone, and it shall be approved by the Burns & Roe Welding Engineers.

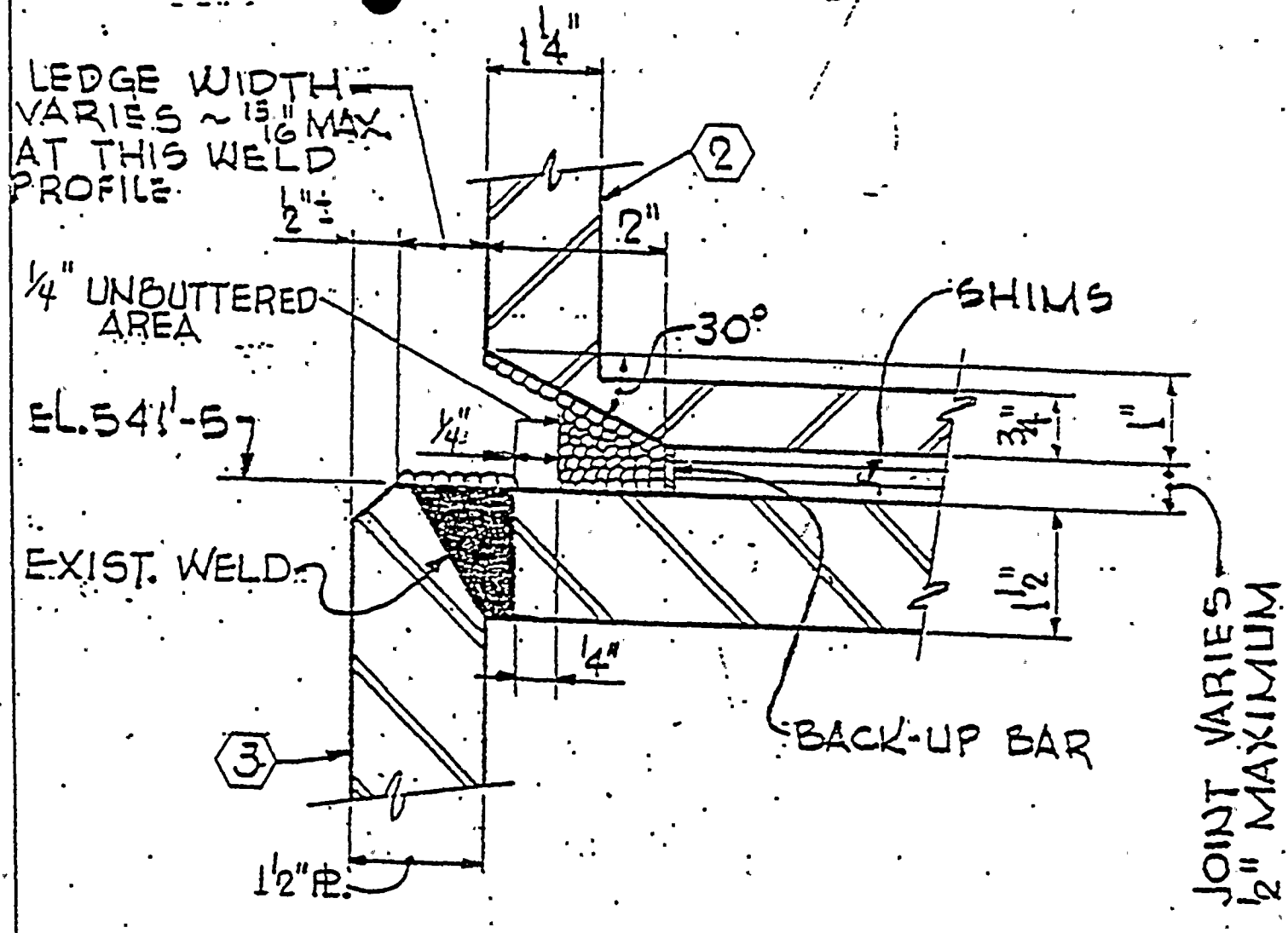
B & R Welding Engineer shall evaluate all rejectable indications revealed by visual or MT inspection prior to any rework.

13) REPAIR SEQUENCE

Remove the indication revealed by visual inspection to sound metal beyond each end of the discontinuity by grinding or chipping. If the defect extends one half inch (½") arc-gouging may be used. The required preheat shall be specified. Arc-gouging is to be used sparingly to minimize the possibility of crack propagation.

Excavation shall be reinspected to assure that the defect has been removed.

Reweld excavated area following appropriate paragraphs in this procedure.

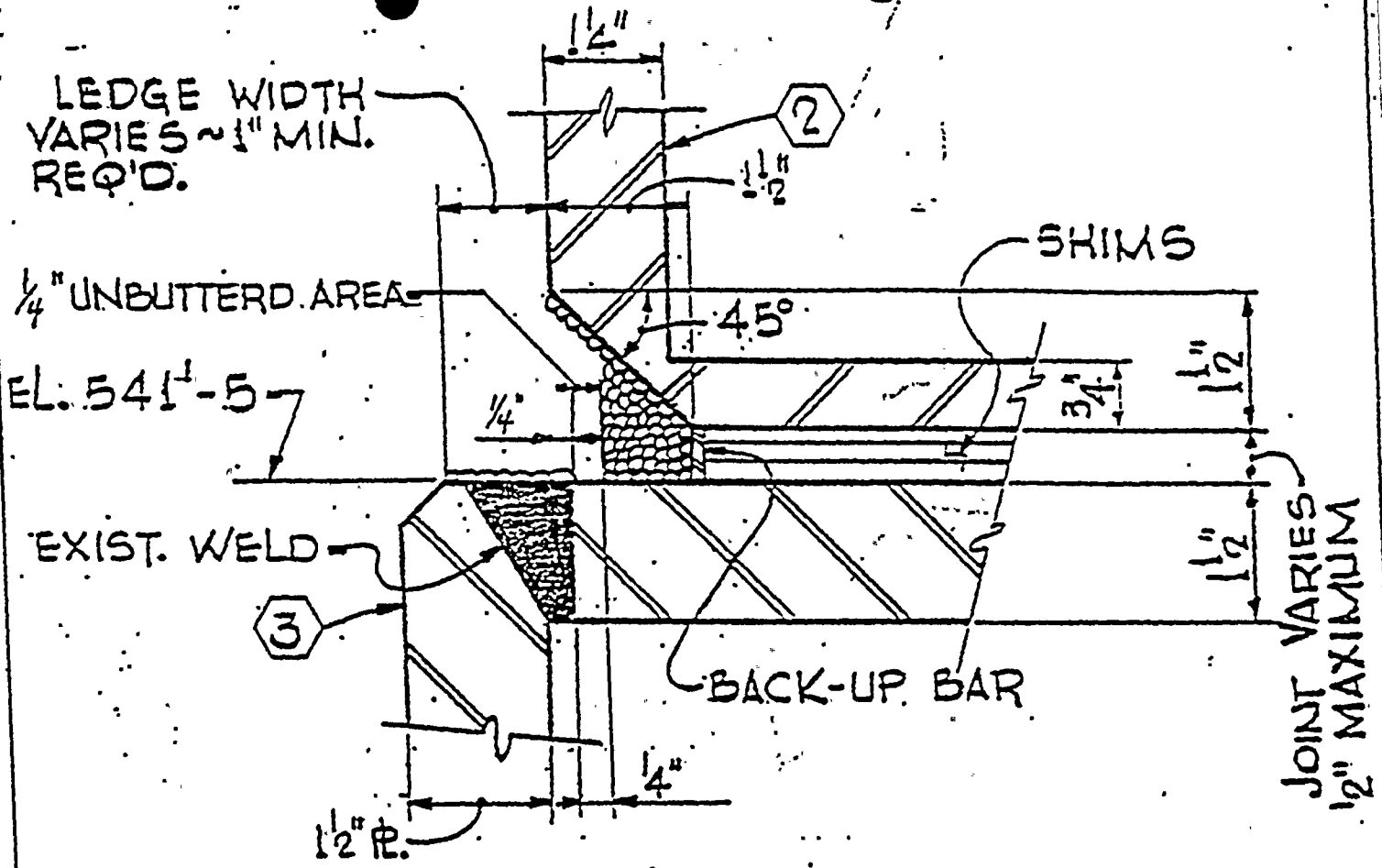


TYPICAL PHASE I WELD DEPOSIT WHERE LEDGE IS LESS THAN 1" WIDE & SIDE R./ BUILT-UP MEMBER ⑤ IS 1½"

1) After root passes have been applied all remaining passes shall be peened. *
2) After all filler material has been applied to buttering on the bottom which shall be within ¼" of existing weld in base material. The ¼" unbuttered area shall be MT inspected. After MT inspection is acceptable, complete buttering and finish weld to designed size. (Note: Buttering shall completely cover existing welds prior to MT inspection of ¼" base material)
3) Any indications that should be picked up by MT or visual inspection shall be evaluated by B & R Welding Eng. prior to any rework.
4) M.P.T. final weld at preheat temp. and 72 hrs. after complete cool down.

*Except cover pass.

REF. DOC.: PCN — NCR 215-5688	WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA: —	BURNS AND ROE, INC.
REF. DWG.: — DWG. ZONE: —	FED 215-W-1604 SHT. 8 OF 15
SCALE: N.T.S. DRAWN BY: DATE: CHKD	TITLE: WELD DEPOSIT

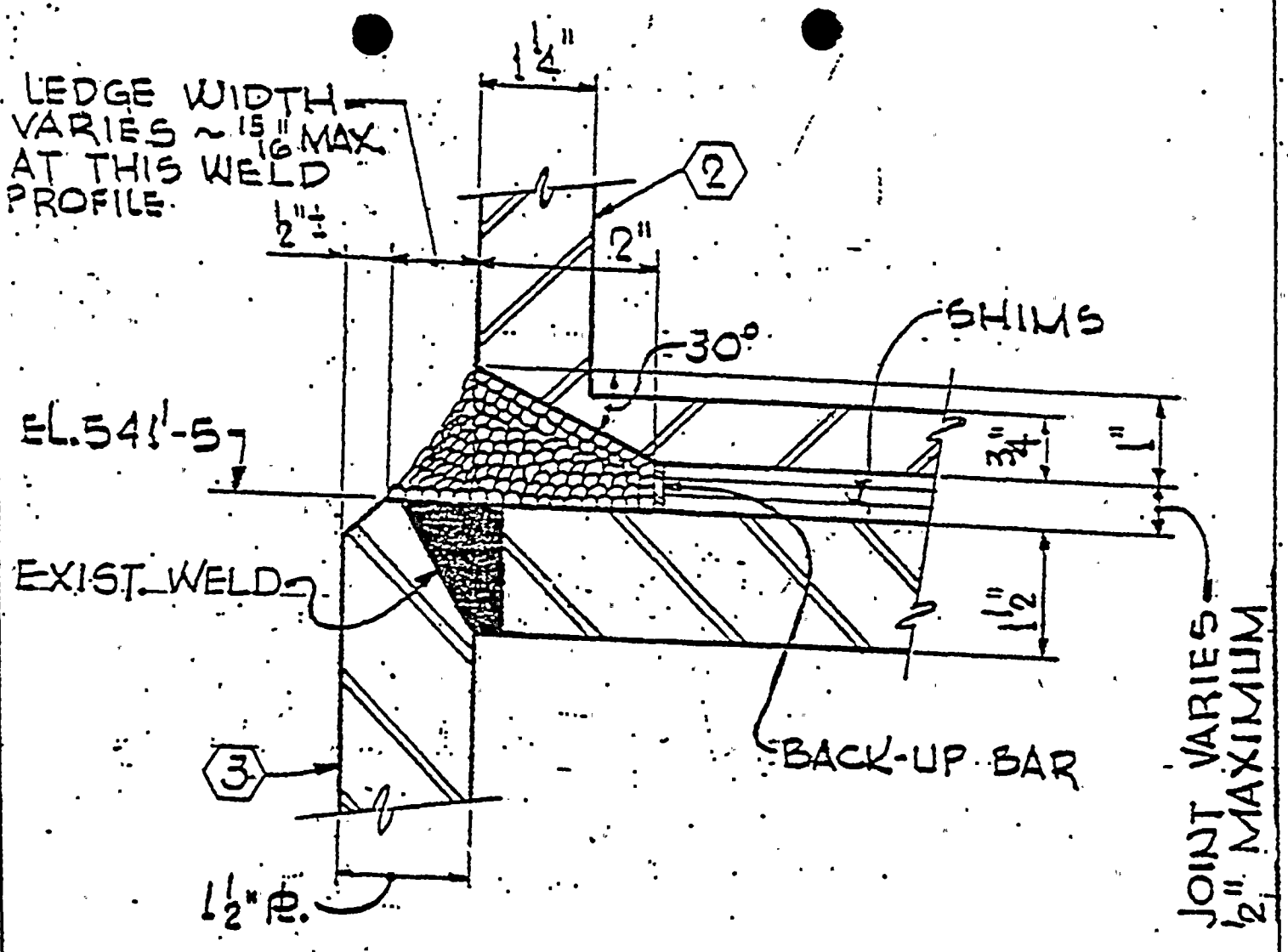


TYPICAL PHASE I WELD DEPOSIT WHERE LEDGE IS A MINIMUM OF 1" WIDE @ SIDE R. / BUILT-UP MEMBER (3) IS 1½"

1) After root passes have been applied all remaining passes shall be peened.*
2) After all filler material has been applied to buttering on the bottom which shall be within ½" of existing weld in base material. The ¼" unbuttered area shall be MT inspected. After MT inspection is acceptable, complete buttering and finish weld to designed size. (Note: Buttering shall completely cover existing welds prior to MT inspection of ½" base material)
3) Any indications that should be picked up by MT or visual inspection shall be evaluated by B & R Welding Eng. prior to any work.
4) M.P.T. final weld at preheat temp. and 72 hrs. after complete cool down.

*Except cover pass.

REF. DOC.: PCN ~~NCR~~ NCR 215-5068	WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: PAGE: PARA:	BURNS AND ROE, INC.
REF. DWG.: DWG. ZONE:	PED 215-W-1604 S- 9 OF 15
SCALE: DRAWN BY: DATE:	TITLE: WELD DEPOSIT DETAIL



TYPICAL PHASE II WELD DEPOSIT WHERE LEDGE IS LESS THAN 1" WIDE & SIDE R. / BUILT-UP MEMBER (3) IS 1 1/2"

1) After root passes have been applied all remaining passes shall be peened. *
2) M.P.T. final weld at preheat temp. and 72 hrs. after complete cool down.

*Except cover pass.

REF. DOC.: PCN ~~PIP~~ NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
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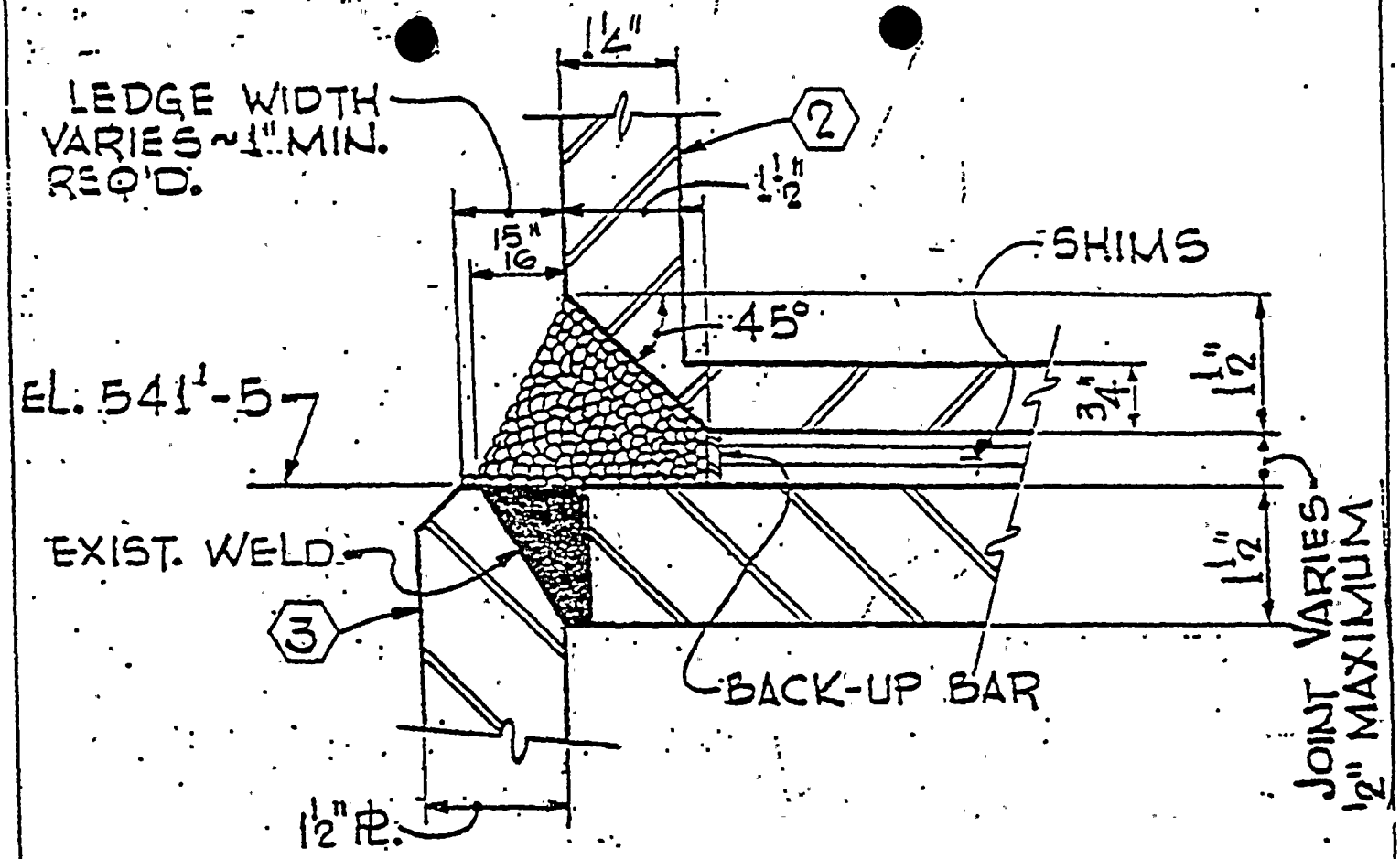
SCALE: N.T.S.	DRAWN BY: DATE: CHKD BY: DATE:	APPVD: DATE:	TITLE: WELD DEPOSIT PHASE II

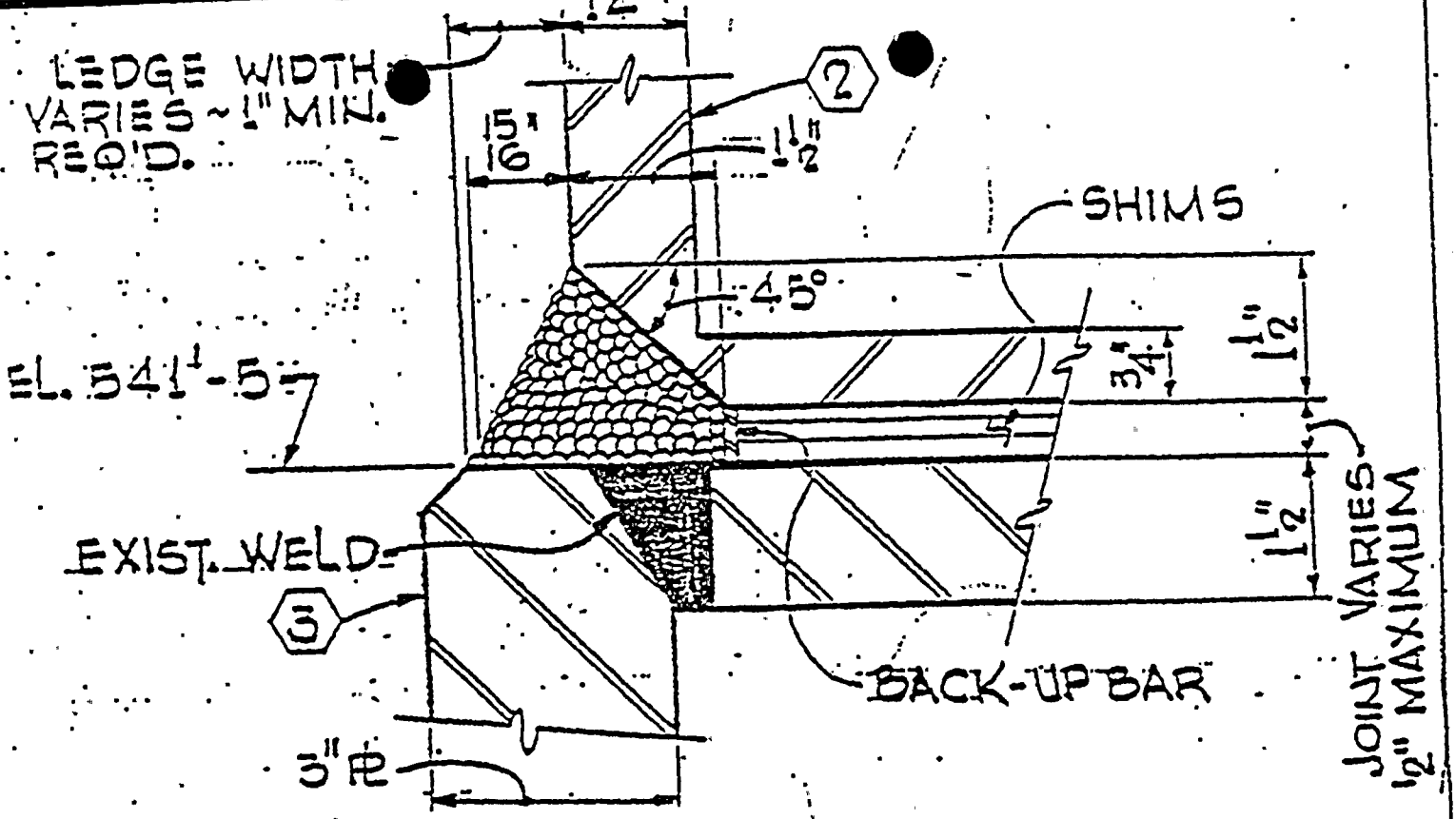


TYPICAL PHASE II WELD DEPOSIT WHERE LEDGE IS A MINIMUM OF 1" WIDE & SIDE R./BUILT-UP MEMBER (3) IS 1½"

1) After root passes have been applied all remaining passes shall be peened. *
2) M.P.T. final weld at preheat temp. and 72 hrs. after complete cool down.

*Except cover pass.

REF. DOC.: PCN — NCR 215-5088		WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA:		BURNS AND ROE, INC.
REF. DWG.: —	DWG. ZONE: —	PED 215-W-1604 SHT 11 OF 15
SCALE: N.T.S.	DRAWN BY: DATE: CHKD BY: UM M DESIGNED APPVD: DATE 3/03/84	TITLE: WELD DEPOSIT PHASE II

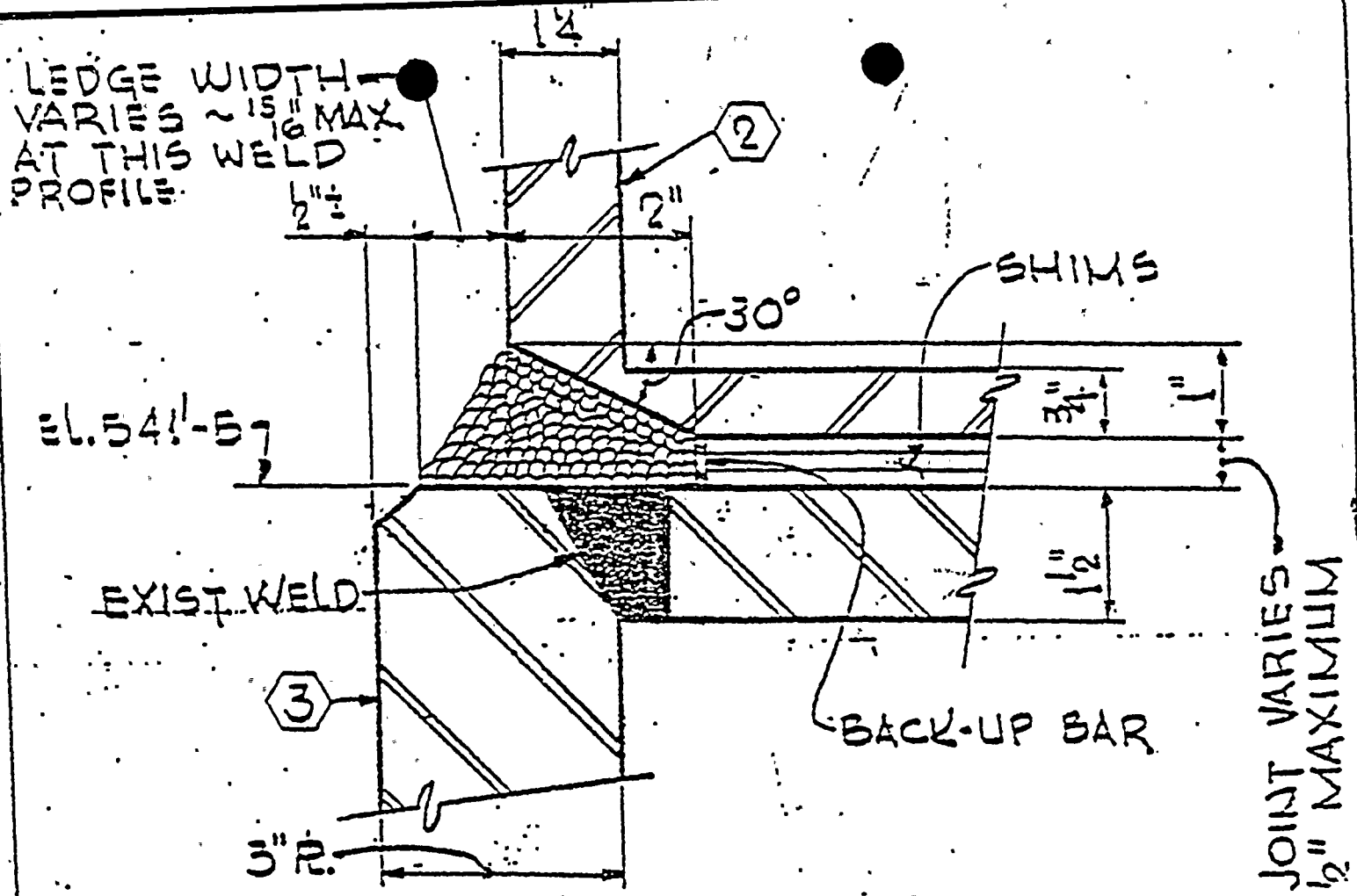


TYPICAL WELD DEPOSIT WHERE LEDGE IS A MINIMUM OF 1" WIDE & SIDE R. / BUILT-UP MEMBER (3) IS 3"

1) After root passes have been applied all remaining passes shall be peened. *
2) M.P.T. final weld at preheat temp. and 72 hrs. after complete cool down.

*Except cover pass.

REF. DOC.: PCN — NCR 215-5688	WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA:	BURNS AND ROE, INC.
REF. DWG.: — DWG. ZONE:	PED 215-W-1604 SHT. 12 OF 15
SCALE: N.T.S. DRAWN BY: DATE. CHKD. APPVD. DATE:	TITLE: WELD DEPOSIT



TYPICAL WELD DEPOSIT WHERE LEDGE IS LESS THAN 1" WIDE & SIDE R. / BUILT-UP MEMBER (3) IS 3"

1) After root passes have been applied all remaining passes shall be peened. *
2) M.P.T. final weld at preheat temp. and 72 hrs. after complete cool down.

*Except cover pass.

REF. DOC: PCN — REF NCR 215-5688		WPPSS NUCLEAR PROJECT NO. 2
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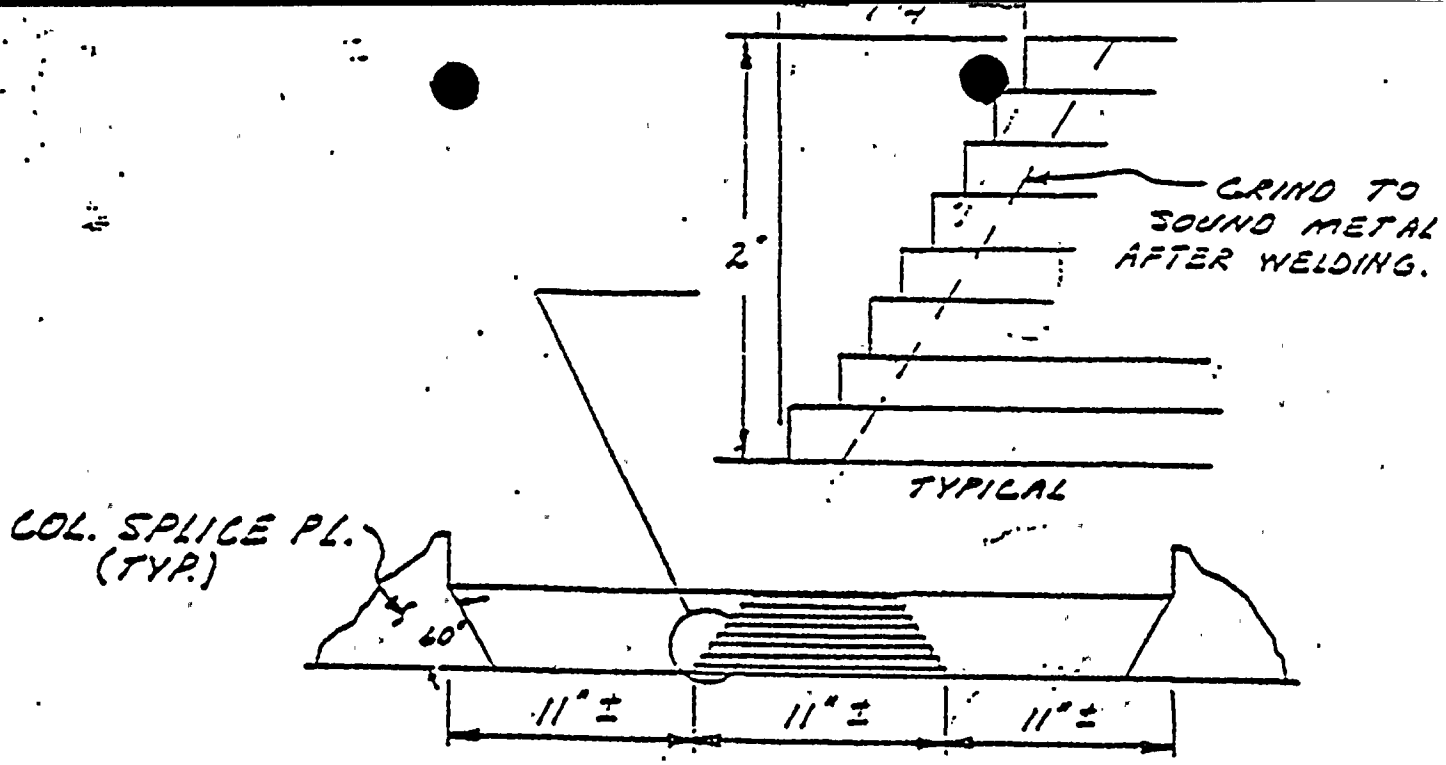
REF. DWG.: — DWG. ZONE:		PE 215-W-1604 SHT. 13 OF 15
SCALE: N.T.S.	DRAWN BY: DATE	TITLE: WELD DEPOSIT



SECTION A-A

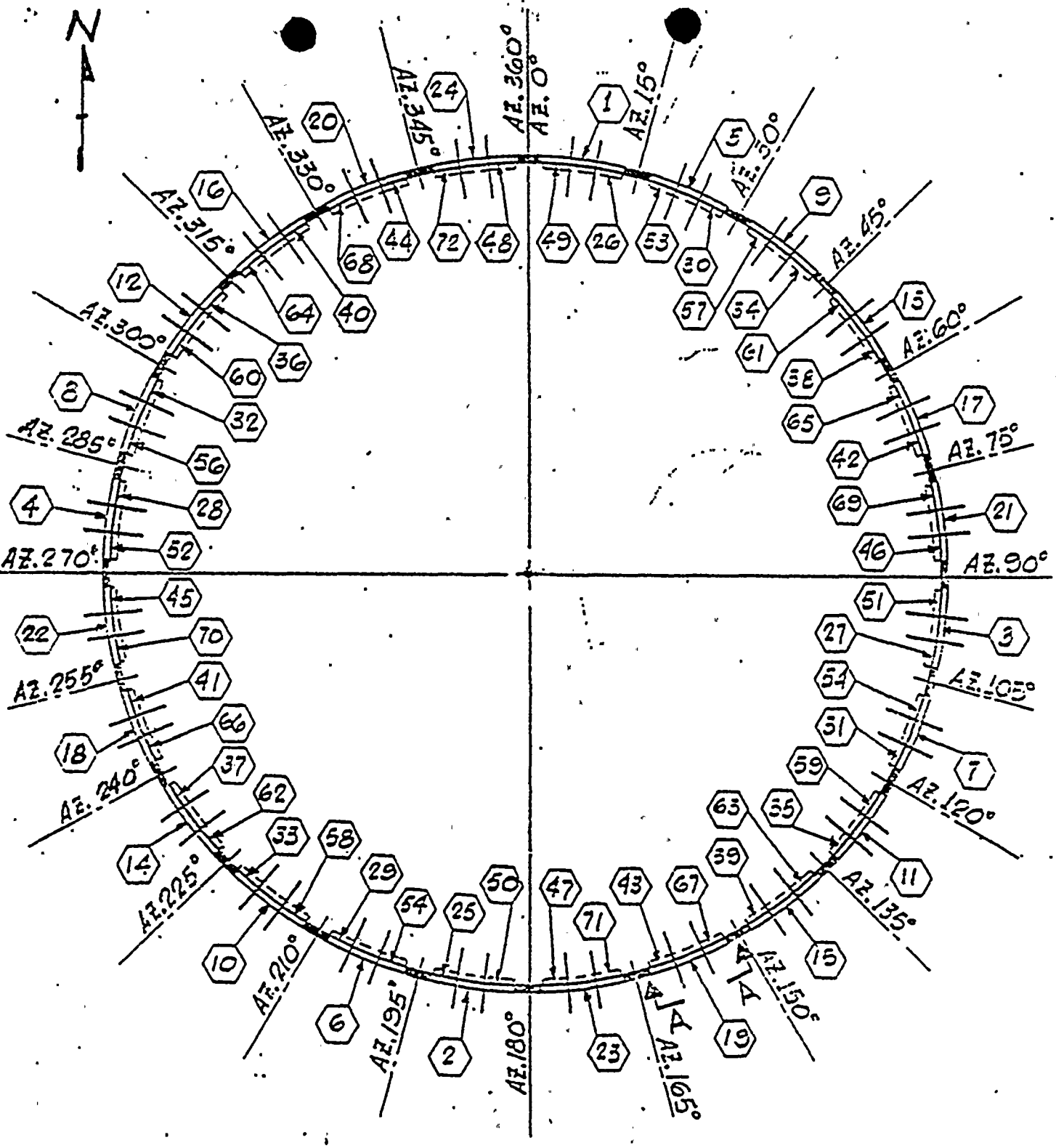
TYPICAL CASCADE WELD DETAIL

NOTES: A) 4'-11" cascade area's shall be made first, to assure that there is no movement to the wall, also to establish the stability for the remaining welding.

B) All remaining welding may be completed in a different sequence if so designated by B & R Welding Engineer.

1) Four (4) welders to weld simultaneously throughout sequence.
2) First sequence to start at AZ. 7°-30'.
3) Second sequence to start at AZ 191°-30'.
4) Third sequence to start at AZ. 103°-30'.
5) No welder shall proceed ahead of any other welder in a sequence.
6) Each sequence number consists of approximately 11".

~~REF DOC. PO#~~ RFT NCR 215-5688		WPPSS NUCLEAR PROJECT NO. 2
~~REF SPEC. SECTION.~~ ~~PAGE.~~ ~~PARA.~~		BURNS AND ROE, INC.
~~REF DWG.~~	~~DWG. ZONE.~~	PED 215-W-1604 SHT 14 OF 15
SCALE. DRAWN BY DATE		TITLE: Weld Deposit
CHKD BY WM.G DATE 3-24-80	APPVD: L Haken DATE 3/25/80	



WORK THIS SHEET WITH SHEET 8 thru 15

REF. DOC.: PCN —— ~~RFI~~ NCR 215-5688		WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: —— PAGE: —— PARA: ——		BURNS AND ROE, INC.
REF. DWG.: ——	DWG. ZONE: ——	PED 215-W-1604 SHT. 15 OF 15
SCALE: N.T.S.	DRAWN BY: KERNER DATE: 12/23/77 CHK'D BY: DATE: 12-27-77	APP'VD: DATE: 1/3/78
		TITLE: WELD SEQUENCE PLAN

BURNS AND ROE, INC.
WPPSS
NUCLEAR PROJECT
NO. 2

PROJECT ENGINEERING DIRECTIVE

CODE	PROJECT ENGINEERING DIRECTIVE
21	215-CS-2741
DATE	03/13/80
PRIORITY	II

REASON FOR P. E. D.:

SLOT WELDS REQUIRED PER DETAIL D-2038 (S782) MADE TO TOP OF SHIMS AND DO NOT CONNECT RING 3 (BEAM TYPE (3)) AND RING 4 (BEAM TYPE (2)) AS REQUIRED.

INFORMATION COPIES N/A

SHEET 1 OF 6

REFERENCES	
SUBJECT	SAC. SHIELD WALL WELDS
LOCATION	EL. 541'-5" ALL AROUND
ENG. SYSTEM	N/A
S/U SYSTEM	
QUALITY CLASS	I
ORIGINATING DOCUMENTS	NCR 215-5688

DESCRIPTION OF WORK:

REPLACE SLOT WELDS WITH A PARTIAL PENETRATION WELD BETWEEN THE UPPER AND LOWER RINGS AS DETAILED ON SHEETS 3 THRU 5 OF THIS P.E.D.

WELD PREPARATION SHALL BE AS DIRECTED ON P.E.D. 215-W-2742.

WELD QUALIFICATION SHALL BE AS DIRECTED ON P.E.D. 215-W-2749.

REPAIR OF GAPS AT SHIMS (NCR 215-4884) SHALL BE AS DIRECTED ON PED 215-M-2746.

WELD SHALL BE MADE AS DIRECTED ON P.E.D. 215-W-1604.

NOTES

1. THIS PED REVISES DIRECTION PREVIOUSLY PROVIDED BY N/A THE FOLLOWING PED(s):
2. THIS PED VOIDS DIRECTION PREVIOUSLY PROVIDED BY N/A THE FOLLOWING PED(s):
3. THIS PED WORK SHOULD BE COORDINATED WITH KNOWN OTHER WORK UNDER THE FOLLOWING PED'S: 215-W-1604, 215-W-2742, 215-W-2749, 215-M-2746
4. THIS PED DEPENDS ON THE PRIOR INSTALLATION OF N/A THE FOLLOWING PED'S:

REVISE:

NONE
DRAWINGS X
SPECIFICATION

APPROVALS:

BKH. Wilson — 3/24/80
DISCIPLINE ENGINEER — DATE

LEAD DISCIPLINE ENGINEER — DATE

S/U LIAISON ENGINEER — DATE

RESIDENT PROJECT ENGINEER — DATE

REV 1 BR 803-2

dupe of 8004070371

PROJECT ENGINEERING DIRECTIVE			CODE	PROJECT ENGINEERING DIRECTIVE
			2 1	2 1 5 - C S - 2 7 4 1
WNP-2	BURNS & ROE, INC.	PAGE 2 OF 62	1 2	3 4 5 6 7 8 9 10 11 12 13 14 15

REFERENCE DRAWINGS

REVISE	DRAWING NO.	SHEET NO.	SUFFIX	REV.
Y	S782			12
Y	S835			06
Y	S838			01
N	S783			11
N	S837			05

22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

REFERENCE DRAWINGS

REVISE	DRAWING NO.	SHEET NO.	SUFFIX	REV.

22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

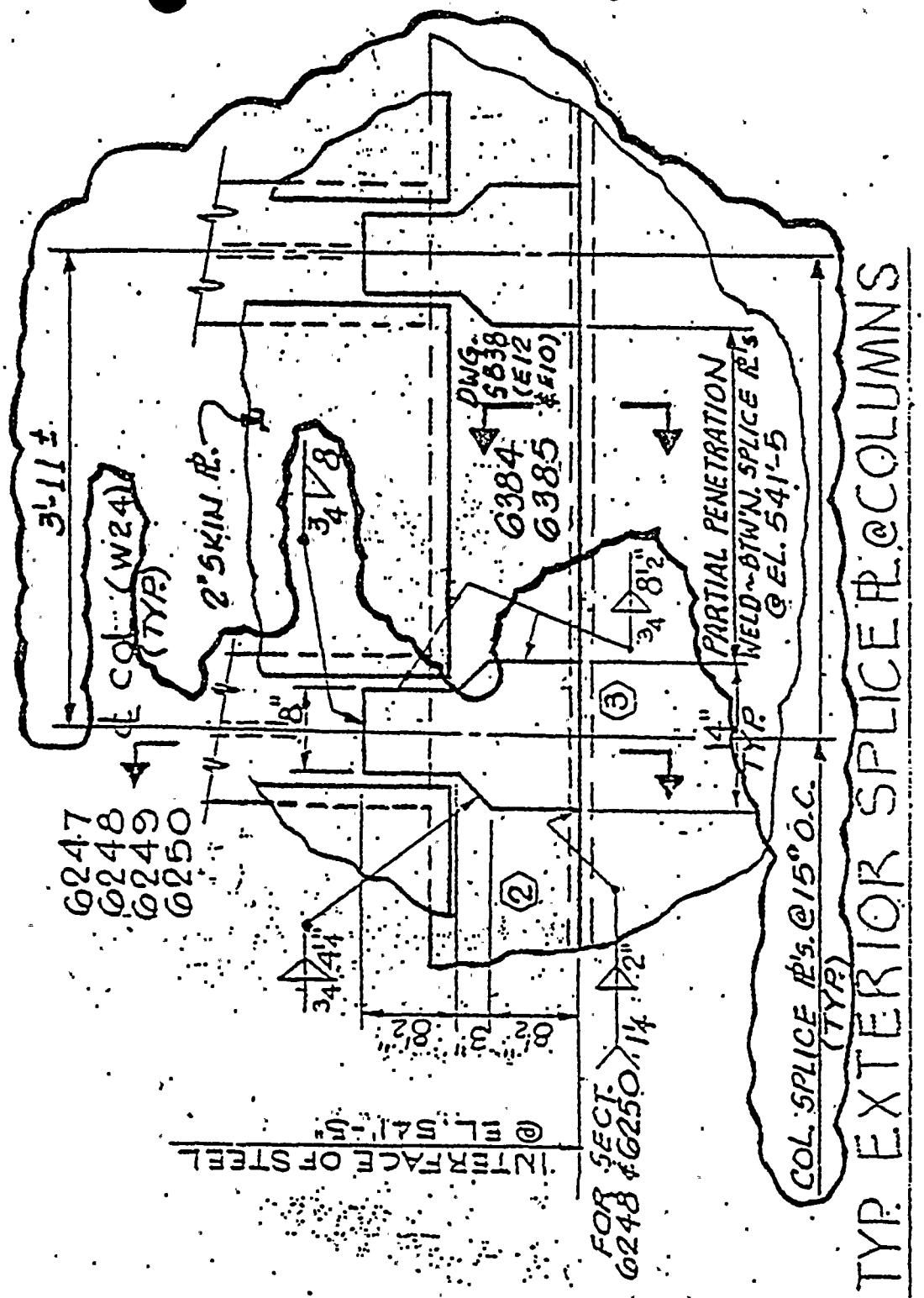
REFERENCE SPEC. PARAGRAPHS

REVISE	SECTION	PARAGRAPH	PAGE	REV.

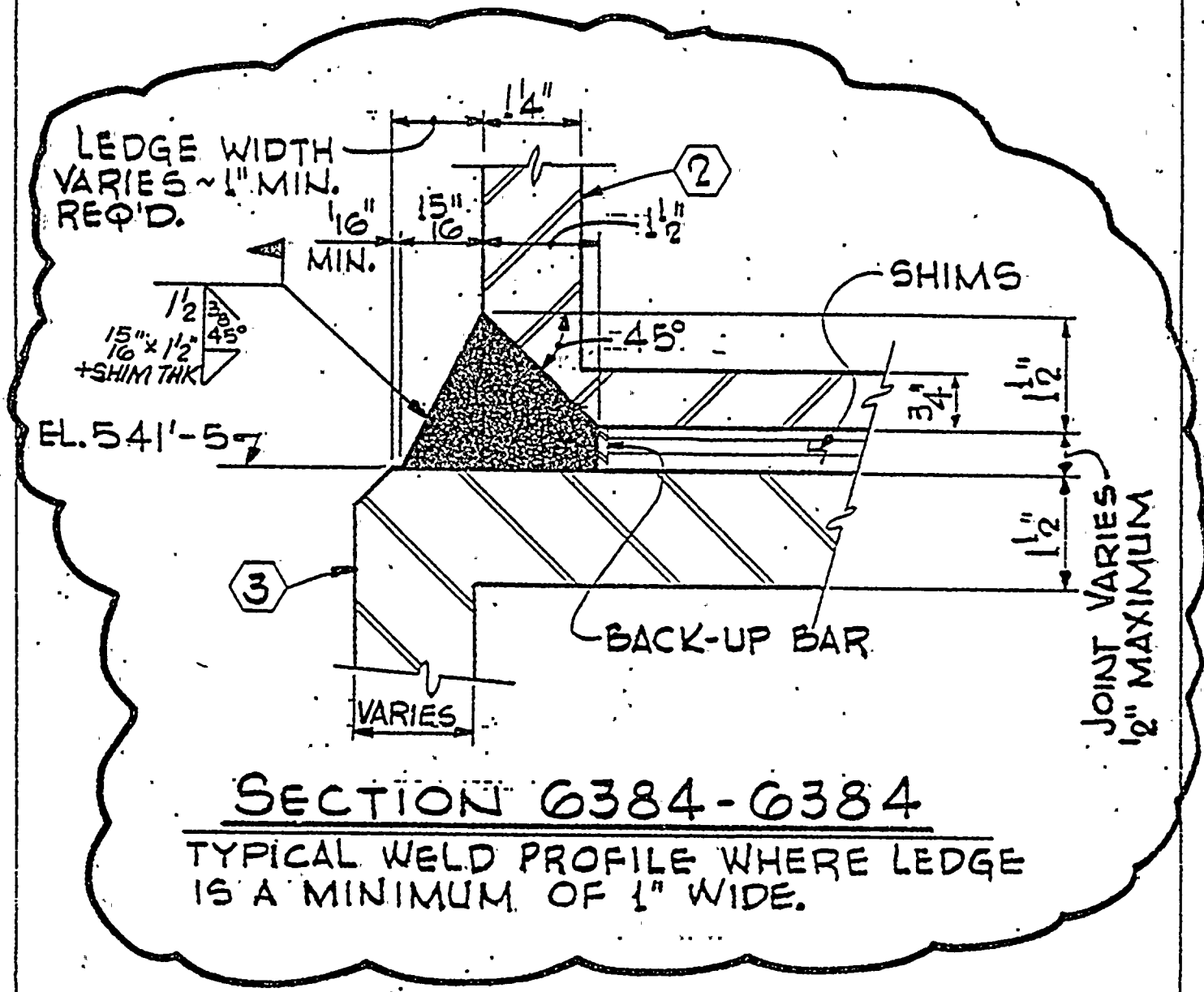
1 2 3 4 5 6 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23 24 25 27 28 29

3.13.80

REV 1 BR 803-1



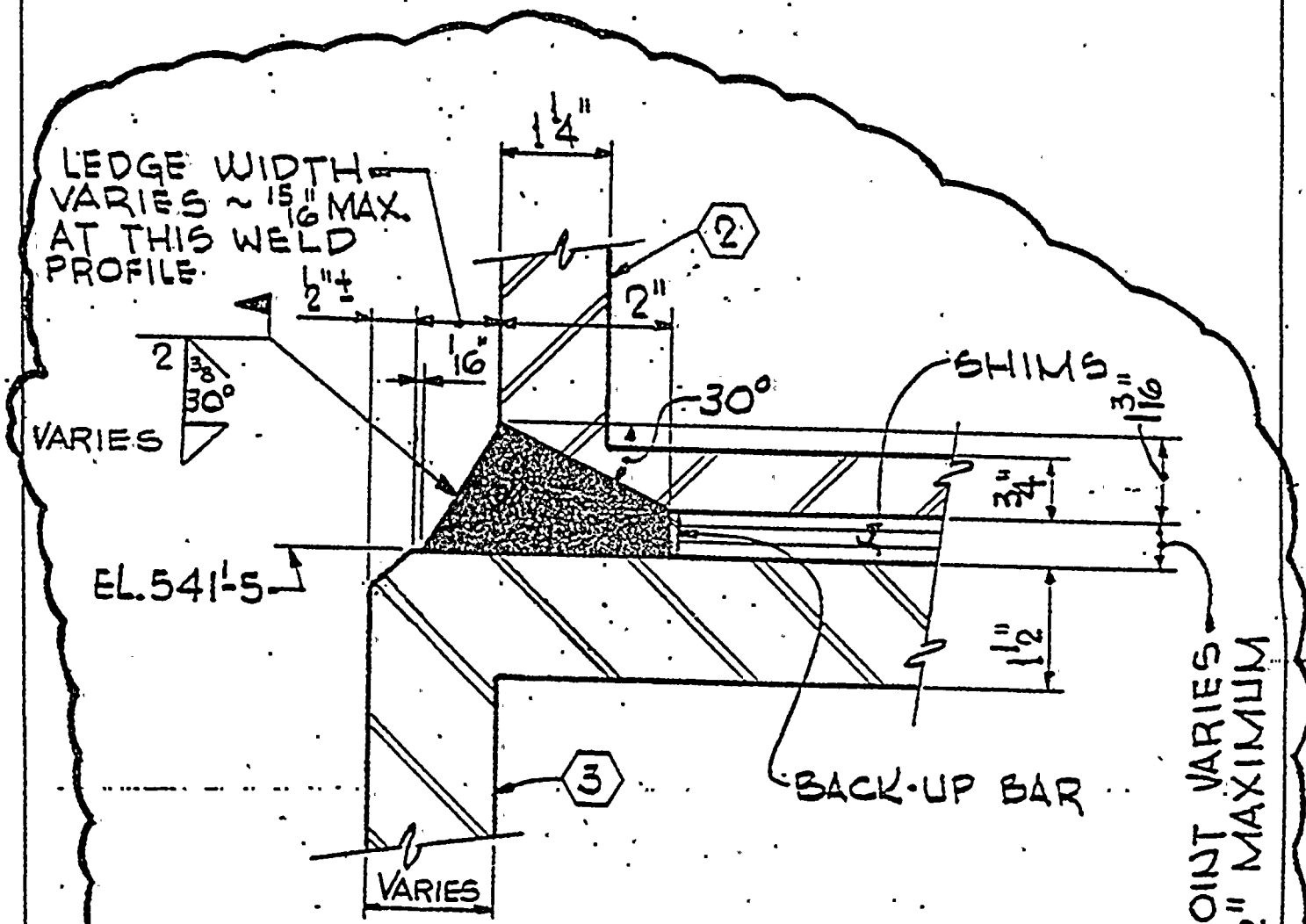
REF. DOC.: PCN —— ~~REF~~ NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: —— PAGE: —— PARA: ——			BURNS AND ROE, INC.
REF. DWG.: S835 REV. 5	DWG. ZONE: B14		PED 215-C5-2741 | SHT. 3 OF 6
SCALE: N.T.S.	DRAWN BY: KERNER DATE 9/24/79		TITLE: REACTOR BUILDING SAC SHIELD WALL SHT. 8
	CHKD BY: JORDAN DATE 3/12/80	APPVD: WMM DATE: 3/24	



SECTION 6384-6384

TYPICAL WELD PROFILE WHERE LEDGE IS A MINIMUM OF 1" WIDE.

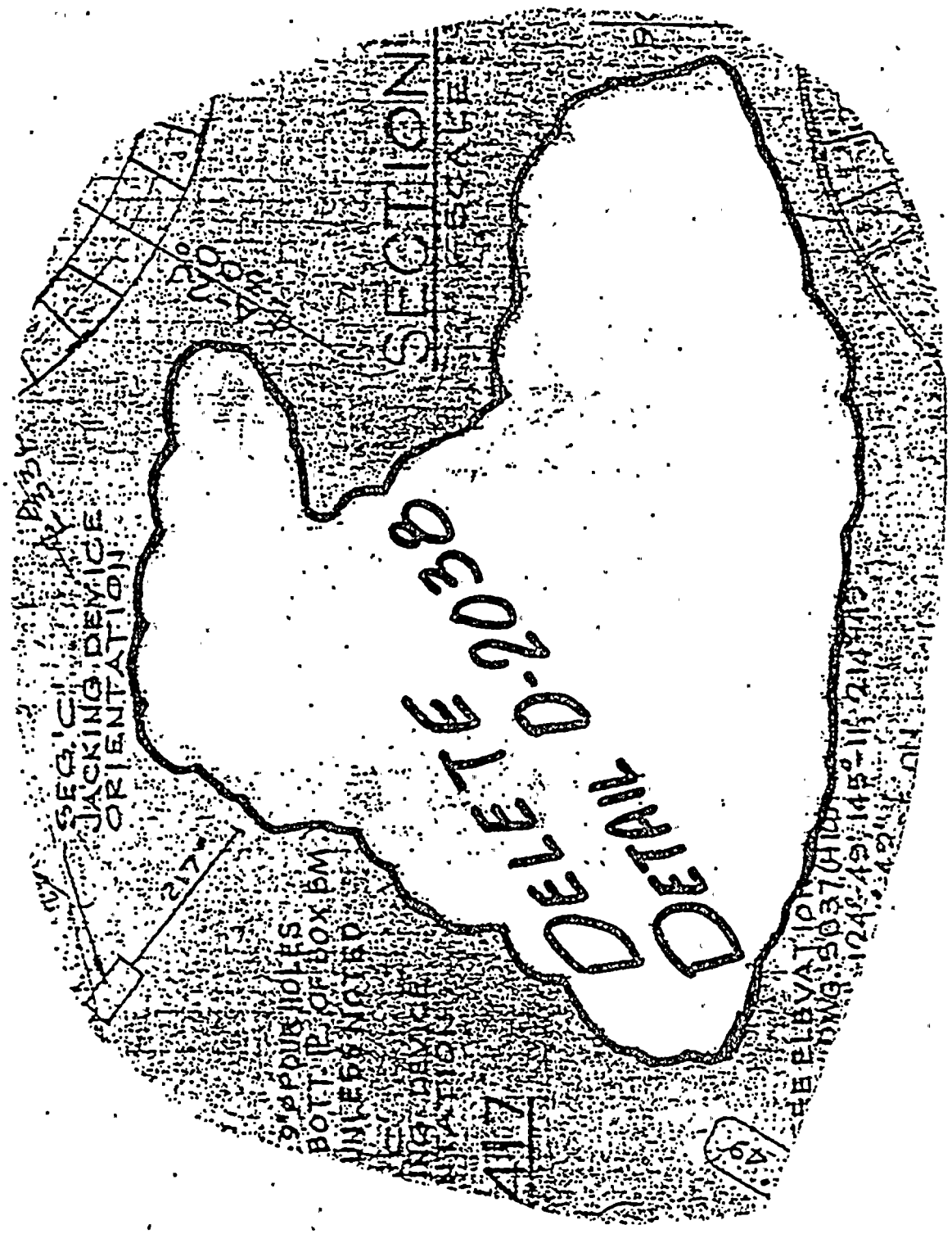
REF. DOC.: PCN —— ~~REF~~ NCA 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: —— PAGE: —— PARA: ——			BURNS AND ROE, INC.
REF. DWG.: 5838 REV. 1	DWG. ZONE: E1.2		PED 215-CS-2741 | SHT. 4 OF 6
SCALE: N.T.S.	DRAWN BY: KERNER DATE: 1/29/79		TITLE: REACTOR BUILDING SAC. SHIELD WALL SHT. 11
	CHKD BY: JORDAN DATE: 2/13/80	APVD: [illegible] DATE: 3/24	



SECTION 6385-6385

TYPICAL WELD PROFILE WHERE LEDGE IS LESS THAN 1" WIDE

REF. DOC.: PCN — AR NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA:			BURNS AND ROE, INC.
REF. DWG.: 5838 REV. 1		DWG. ZONE: E10	PED 215-CS-2741 SHT. 5 OF 6
SCALE: N.T.S.	DRAWN BY: KERNER DATE: 3/12/80		TITLE: REACTOR BLDG. SAC. SHIELD WALL SHT. 11
	CHKD BY: JORDAN DATE: 3/13/80	APPVD: WMM DATE: 3/24	



REF. DOC.: PCN —— NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: —— PAGE: —— PARA: ——			BURNS AND ROE, INC.
REF. DWG.: S782 REV. 12		DWG. ZONE: D5	PED 215-C3-2741 SHT. 6 OF 6
SCALE: N.T.S.	DRAWN BY: KERNER DATE: 12/29/78		TITLE: REACTOR BUILDING SAC. SHIELD WALL SHT. 1
	CHKD BY: [illegible] DATE: 3/12/80	APPV'D: [illegible] DATE: 3/14	

BURNS AND ROE, INC.
WPPSS
NUCLEAR PROJECT
NO. 2

PROJECT
ENGINEERING
DIRECTIVE

COPY | PROJECT ENGINEERING DIRECTIVE

2		2	1	5		-		W	-	2	7	4	2
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

DATE 0 3 / 1 4 / 8 0 PRIORITY I

16 17 X 18 19 X 20 21

REASON FOR P. E. D.:

This PED is for the preparation of the partial penetration weld joint to be used on the sac. wall at 541'-5" el.

INFORMATION COPIES

SHEET 1 OF 6

REFERENCES	
SUBJECT	Sac. Shield Wall Welds
LOCATION	541'-5" All A
ENG. SYSTEM	N/A
S/U SYSTEM	NA
QUALITY CLASS	I
ORIGINATING DOCUMENTS	NCR-215-5688

DESCRIPTION OF WORK:

Refer to pages 2 through 6 of this PED for direction of weld joint preparation as shown on attached details.

NOTES

1. THIS PED REVISES DIRECTION PREVIOUSLY PROVIDED BY THE FOLLOWING PED(s): N/A
2. THIS PED VOIDS DIRECTION PREVIOUSLY PROVIDED BY THE FOLLOWING PED(s): N/A
3. THIS PED WORK SHOULD BE COORDINATED WITH KNOWN OTHER WORK UNDER THE FOLLOWING PED'S: 215-W-2749, 215-CS-2741, 215-W-1604
4. THIS PED DEPENDS ON THE PRIOR INSTALLATION OF THE FOLLOWING PED'S: N/A

REVISE:

NONE
DRAWINGS N/A
SPECIFICATION

APPROVALS:

M. Gothans 5-24-80
DISCIPLINE ENGINEER DATE

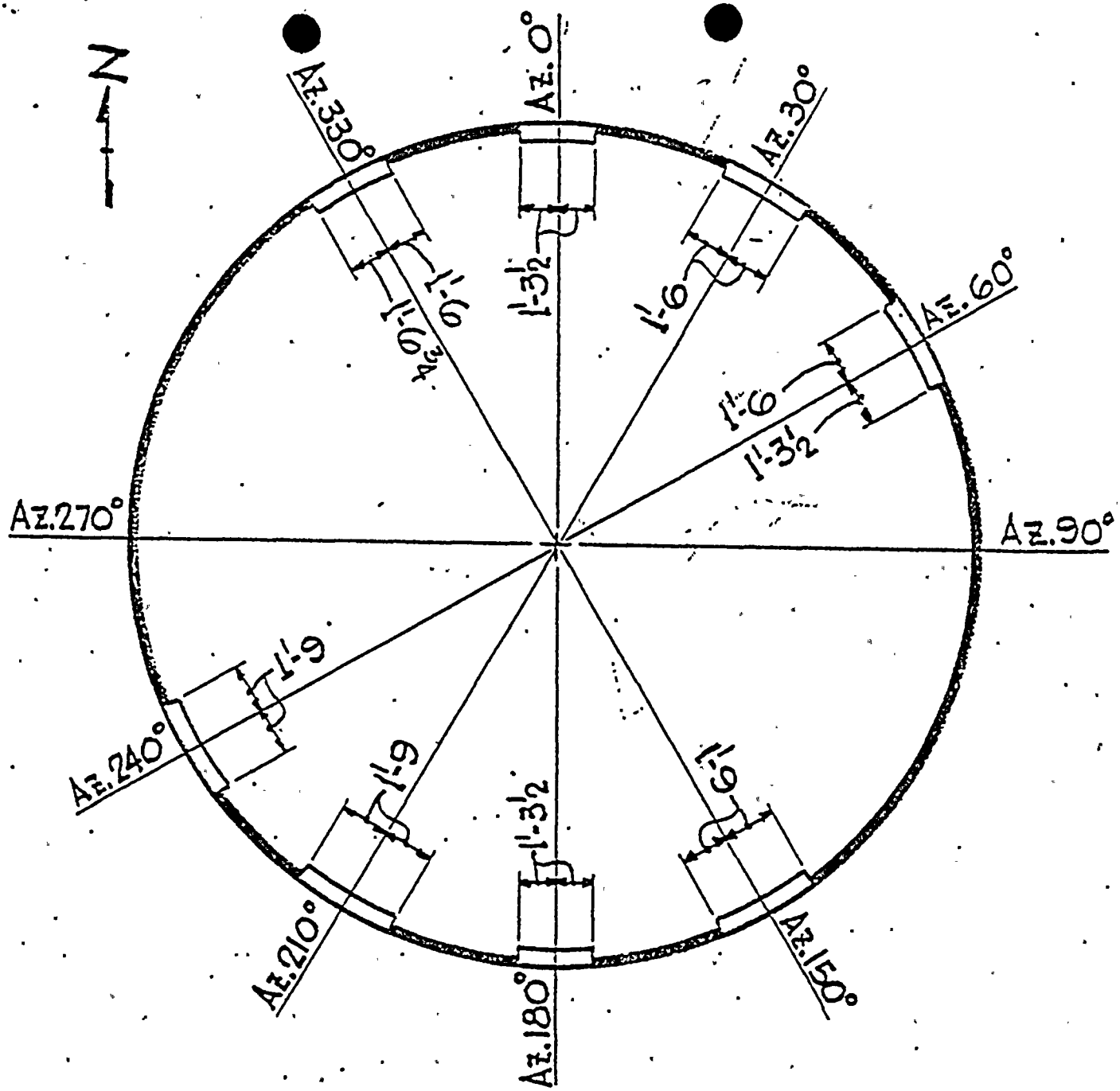
L. F. Allers 3/25/80
LEAD DISCIPLINE ENGINEER DATE

S/U LIAISON ENGINEER DATE

RESIDENT PROJECT ENGINEER DATE

REV 1 BR 803-2

dupe of 8004070372

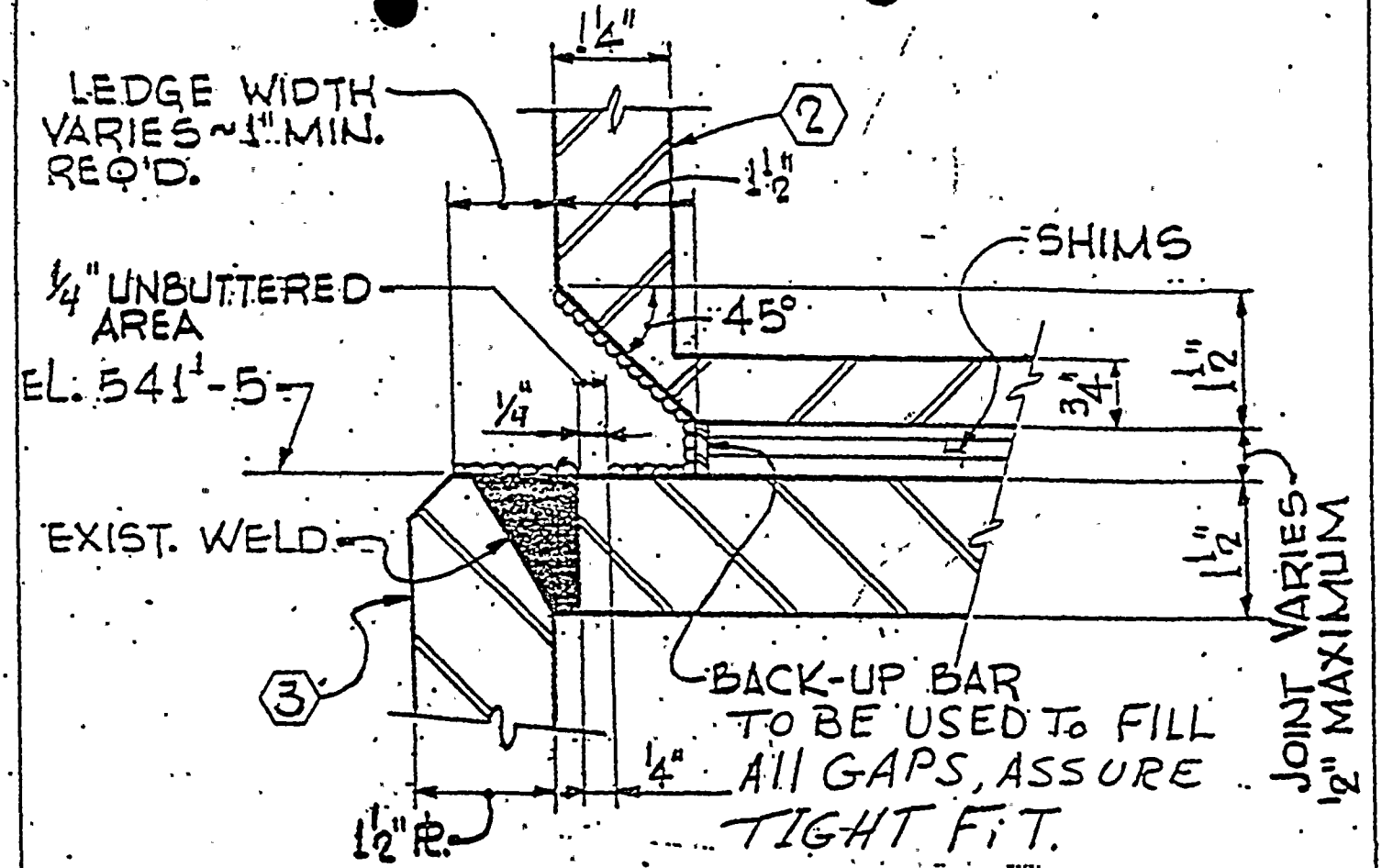


PLAN (T.O.S. EL. 541'-5)

▨ SHADED AREAS INDICATE 1½" THK. SIDE PL. ON BUILT-UP MEMBER (3)

▭ UNSHADED AREAS INDICATE 3" THK. SIDE PL. ON BUILT-UP MEMBER (3)

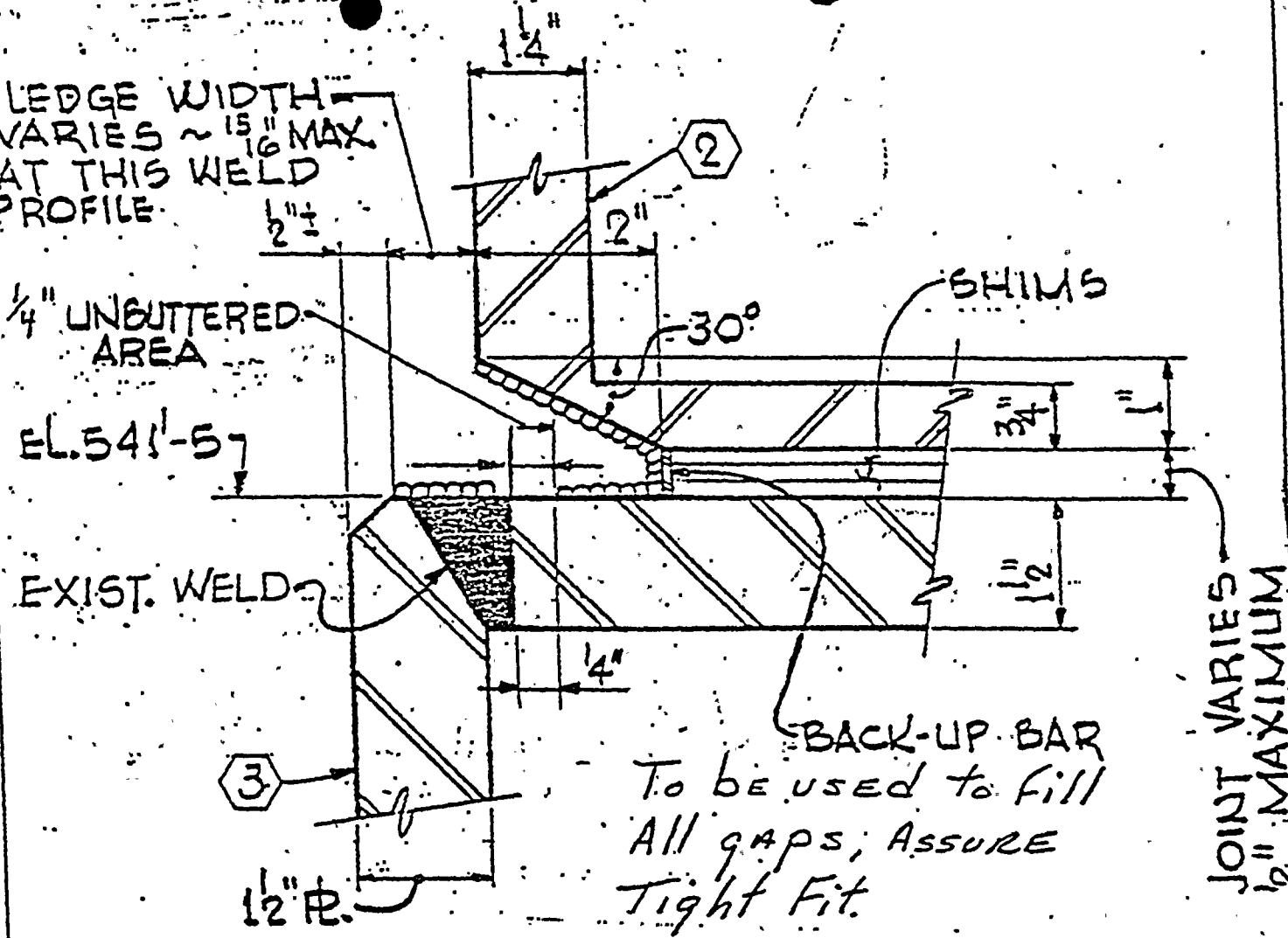
REF. DOC.: PCN — NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA:			BURNS AND ROE. INC.
REF. DWG.: —	DWG. ZONE: —		PED 215-W-2742 SHT 2 OF 6
SCALE: N.T.S.	DRAWN BY. DATE:		TITLE: PLAN OF BUILT-UP MEMBER (3)
	CHKD BY. DATE:	DATE:	



TYPICAL WELD PREPARATION WHERE LEDGE IS A MINIMUM OF 1" WIDE & SIDE R. / BUILT-UP MEMBER (3) IS 1½"

NOTE:
1) Insure proper preheat of 200°F. ± 25°F. with 1½ hrs. soak time prior to air arc-gouging joint preparation.
2) Clean and grind after air arc-gouging to a visual acceptance per AWS D1.1 prior to welding.
3) Joint preparation shall have a minimum root gap of 3/8" with installation of backing where open root exist.
4) Complete I.D. of weld joint shall be buttered with SMAW E7018 process prior to welding except ¼" area of base material shown on detail.
5) Existing column splice welds shall not be removed, only beveled to make joint preparation acceptable.

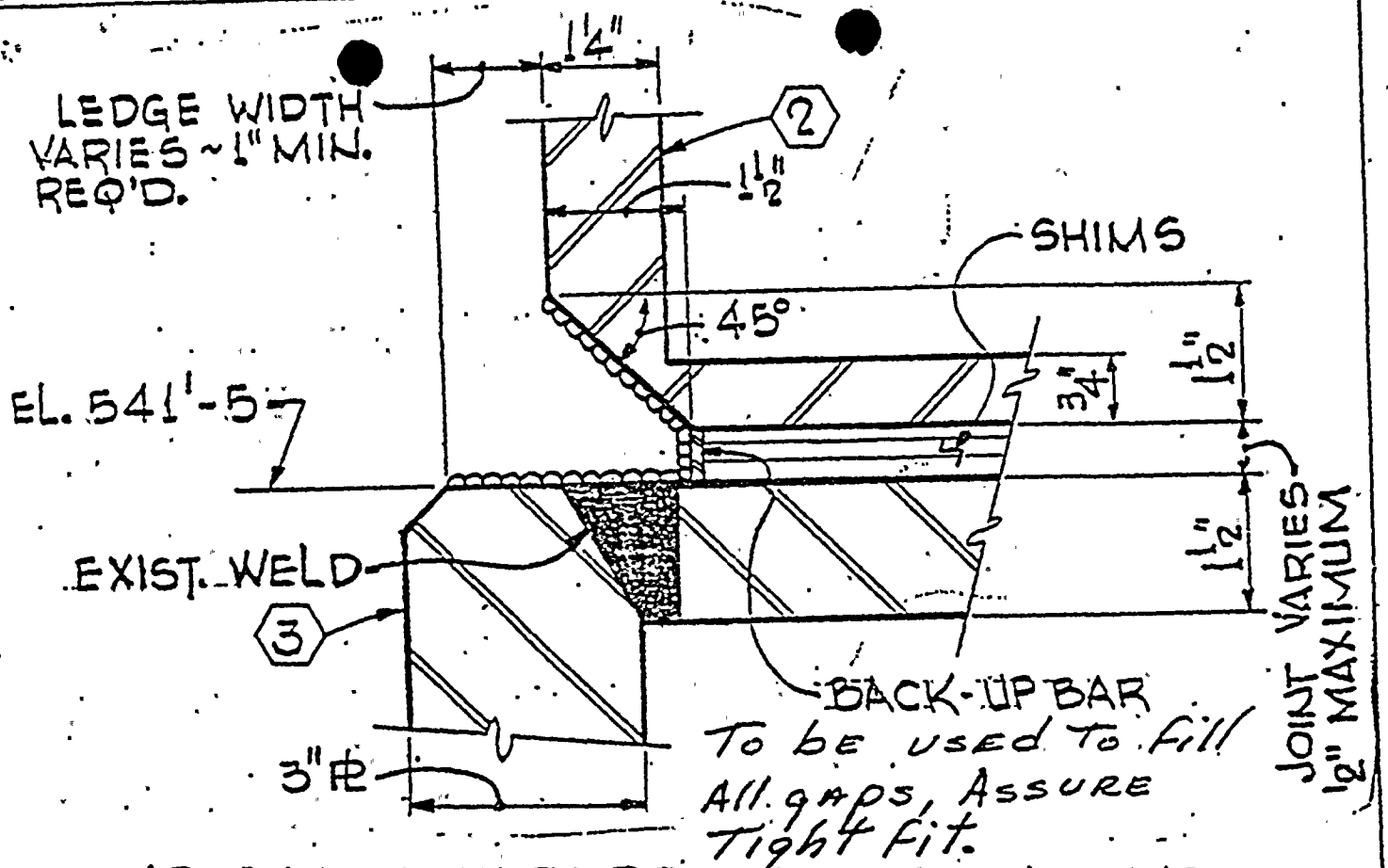
REF. DOC.: PCN — ~~RFI~~ NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA:			BURNS AND ROE, INC.
REF. DWG.: —	DWG. ZONE: —		PED 215-W-2742 SHT. 3 OF 6
SCALE: N.T.S.	DRAWN BY: DATE:	CHKD BY: DATE:	APPD: DATE:
			TITLE: WELD PREPARATION



TYPICAL WELD PREPARATION WHERE LEDGE IS LESS THAN 1" WIDE & SIDE R. / BUILT-UP MEMBER ③ IS 1½"

NOTE:
1) Insure proper preheat of 200°F. ± 25°F. with 1½ hrs. soak time prior to air arc-gouging joint preparation.
2) Clean and grind after air arc-gouging to a visual acceptance per AWS D1.1 prior to welding.
3) Joint preparation shall have a minimum root gap of 3/8" with installation of backing where open root exist.
4) Complete I.D. of weld joint shall be buttered with SMAW E7018 process prior to welding except ¼" area of base material shown on detail.
5) Existing column splice welds shall not be removed, only beveled to make joint preparation acceptable.

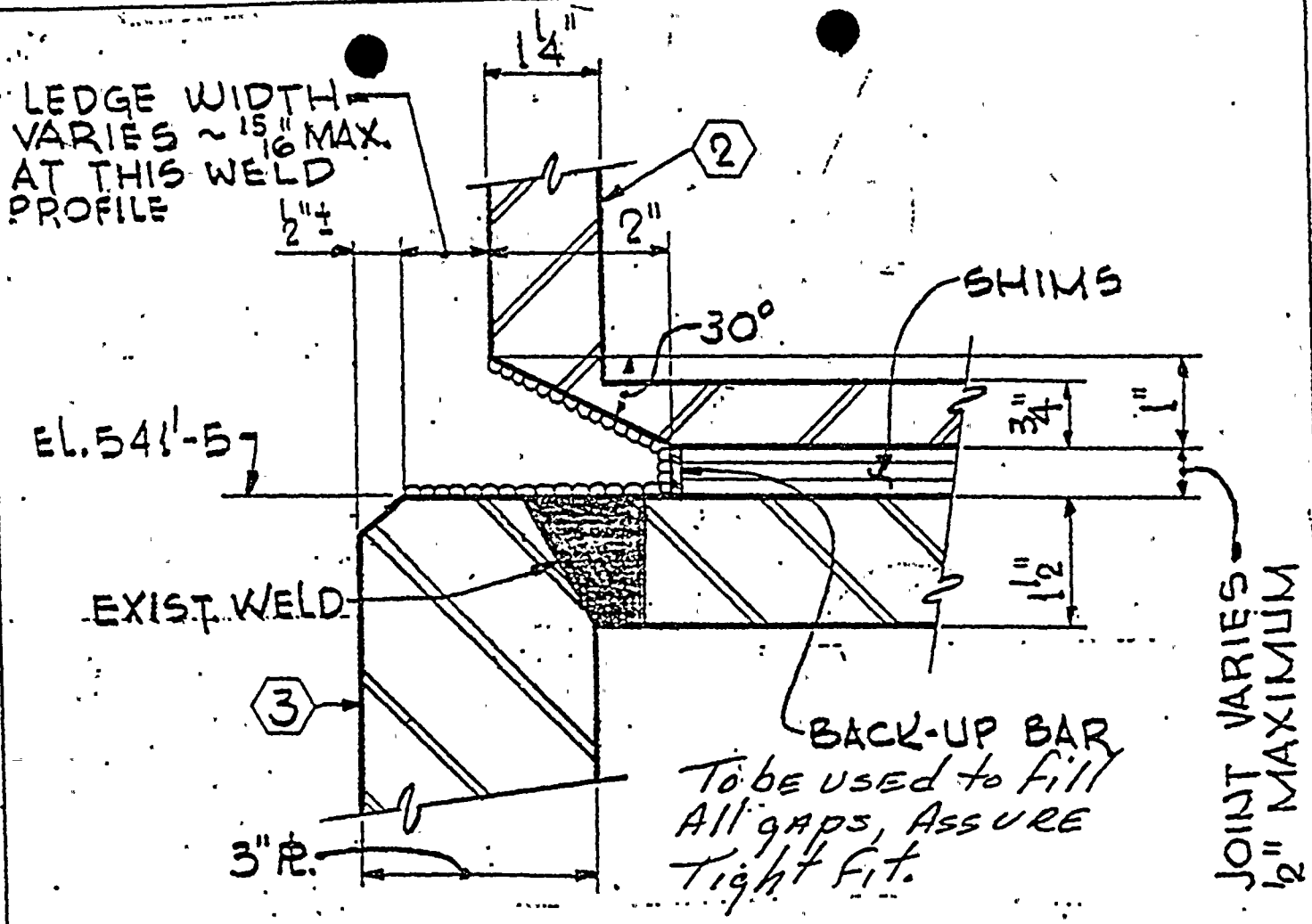
REF. DOC.: PCN — REF NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA:			BURNS AND ROE, INC.
REF. DWG.:		DWG. ZONE:	PED 215-W-2742 SHT. 4 OF 6
SCALE: N.T.S.	DRAWN BY: DATE		TITLE: WELD PREPARATION
	CHKD BY: MB DATE 2-4-80 APPD: DATE 2-5-80		



TYPICAL WELD PREPARATION WHERE LEDGE IS A MINIMUM OF 1" WIDE & SIDE PL. / BUILT-UP MEMBER (3) IS 3"

NOTE:
1) Insure proper preheat of 200°F. ± 25°F. with 1½ hrs. soak time prior to air arc-gouging joint preparation.
2) Clean and grind after air arc-gouging to a visual acceptance per AWS D1.1 prior to welding.
3) Joint preparation shall have a minimum root gap of 3/8" with installation of backing where open root exist.
4) Complete I.D. of weld joint shall be buttered with SMAW E7018 process prior to welding.
5) Existing column splice welds shall not be removed, only beveled to make joint preparation acceptable.

REF. DOC.: PCN ~~RFT~~ NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: — PAGE: — PARA: —			BURNS AND ROE, INC.
REF. DWG.: —	DWG. ZONE: —		PED 215-W-2742 SHT. 5 OF 6
SCALE: N.T.S.	DRAWN BY: DATE:		TITLE: WELD PREPARATION
	CHKD BY: [illegible] DATE: 2-29-80	APP'D: [illegible] DATE: 3-4-80	



TYPICAL WELD PREPARATION WHERE LEDGE IS LESS THAN 1" WIDE & SIDE R. / BUILT-UP MEMBER (3) IS 3"

NOTE:
1) Insure proper preheat of 200°F. ± 25°F. with 1½ hrs. soak time prior to air arc-gouging joint preparation.
2) Clean and grind after air arc-gouging to a visual acceptance per AWS D1.1 prior to welding.
3) Joint preparation shall have a minimum root gap of 3/8" with installation of backing where open root exist.
4) Complete I.D. of weld joint shall be buttered with SMAW E7018 process prior to welding.
5) Existing column splice welds shall not be removed, only beveled to make joint preparation acceptable.

REF. DOC.: PCN ~~RFI~~ NCR 215-5688			WPPSS NUCLEAR PROJECT NO. 2
REF. SPEC. SECTION: ——— PAGE: ——— PARA: ———			BURNS AND ROE, INC.
REF. DWG.: ———	DWG. ZONE: ———		PED 215-W-2742 SHT. 6 OF 6
SCALE: N.T.S.	DRAWN BY: DATE:		TITLE: WELD PREPARATION
	CHKD BY: DATE: 3/24/80	APP'VD: DATE: 3/24/80	

BURNS AND ROE, INC.
WPPSS
NUCLEAR PROJECT
NO. 2

PROJECT ENGINEERING DIRECTIVE

CODE	PROJECT ENGINEERING DIRECTIVE													
2	1	[redacted]		2	1	5		-	W		-	2	7	4	0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
DATE	0	3	/	1	4	/	8	0		PRIORITY					
X		16	17	X	18	19	X	20	21	I					

REASON FOR P. E. D.:

This PED is to allow the contractor to prepare for welding to be done by Dual Shield FCAW Process.

INFORMATION COPIES

SHEET 1 OF 1

REFERENCES	
SUBJECT	Dual Shield FCAW Qualification
LOCATION	El. 541'-5"
ENG. SYSTEM	N/A
S/U SYSTEM	N/A
QUALITY CLASS	I
ORIGINATING DOCUMENTS	NKK-215-5688

DESCRIPTION OF WORK:

Contractor shall obtain machinery, welding wire and test materials to qualify a procedure and personnel, suitable to perform necessary capacity of welding to be done on the Sac. Wall.

Contractor shall coordinate all operations with Burns and Roe Welding Engineer in contractors establishment for qualifying procedures and personnel, to inable this program to be expedited.

The procedure and personnel shall be qualified in the horizontal position. The test plate for qualifying the procedure and personnel shall be in accordance with AWS D1.1 and Spec. 215-17D. A 2'x 2' mock-up of the plate thickness (as close as possible), and joint design shall be welded by each welder prior to welding on the Sac. Wall.

Type of Machinery Required

12
Manufacturer: Airco Flux Core Welding Machines

John Brosnann
(415) 658-5010

Type of Filler Metal Required

25 lb. spools
(1500 lbs)
(Dia. .045)
Dual Shield
(E-70T-1)

Manufacturer:
Chemetrom Welding Supply
(206) 682-2880

Gas - Argon - CO_2
98-2%

NOTES

1. THIS PED REVISES DIRECTION PREVIOUSLY PROVIDED BY THE FOLLOWING PED(S): N/A
2. THIS PED VOIDS DIRECTION PREVIOUSLY PROVIDED BY THE FOLLOWING PED(S): N/A
3. THIS PED WORK SHOULD BE COORDINATED WITH KNOWN OTHER WORK UNDER THE FOLLOWING PED'S: N/A
4. THIS PED DEPENDS ON THE PRIOR INSTALLATION OF THE FOLLOWING PED'S N/A

REVISE:

NONE
DRAWINGS N/A
SPECIFICATION

APPROVALS:

[signature] DISCIPLINE ENGINEER	3-24-80 DATE
[signature] LEAD DISCIPLINE ENGINEER	3-25-80 DATE
S/U LIAISON ENGINEER	DATE
RESIDENT PROJECT ENGINEER	DATE

REV 1 BR 803-2

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