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 BOUCHEY, G.D. Washington Public Power Supply System
 RECIP. NAME RECIPIENT AFFILIATION
 YOUNGBLOOD, B.J. Licensing Branch 1

SUBJECT: Forwards hardship exemption request for accepting as is
 sacrificial shield wall weld defects identified as being in
 violation of AWS D1.1, Revisions 1-73 Code. Certificate of Svc
 encl.

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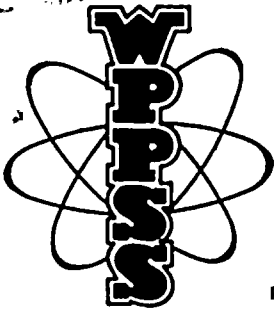
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February 20, 1981
G02-81-29

Docket No. 50-397

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing

Dear Mr. Youngblood:

Subject: WPPSS NUCLEAR PROJECT NO. 2
HARDSHIP EXEMPTION REQUEST
WNP-2 SACRIFICIAL SHIELD WALL

Reference: Letter G02-81-25, dated February 17, 1981, GD Bouchey
(WPPSS) to RL Tedesco (NRC), subject "Sacrificial
Shield Wall Repairs"

Attached herewith is a hardship exemption request for accepting as-is some specific SSW weld defects identified as being in violation of the AWS D1.1 (Rev. 1-73) Code. The balance of the SSW weld defects identified as being in violation of the code will be repaired to meet the code requirements. This was mentioned in the reference letter and is per the agreed upon understanding from the January 22nd meeting with you concerning the open items remaining on your review of the WNP-2 Sacrificial Shield Wall (SSW).

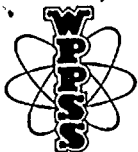
With your approval of this hardship exemption request, it is our understanding that all NRR concerns with the WNP-2 Sacrificial Shield Wall will have been resolved. Accordingly, we request your expedited review and approval of this request and associated release from the current



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Washington Public Power Supply System

BJ Youngblood
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technical hold on construction activities involving the Sacrificial Shield Wall. This will allow us to proceed with work activities on the wall at the earliest possible times so as to minimize critical path schedule impacts in the drywell.

In summary, out of 156 AWS D1.1 defects identified, the following is the disposition:^{1/}

- (1) 115 defects will be repaired to meet AWS D1.1,
- (2) 20 defects upon reevaluation were found to be in conformance with AWS D1.1,
- (3) 5 defects are requested to be considered for hardship exemption based upon the original visual inspection criteria, and
- (4) 16 subsurface or internal defects are requested to be considered for hardship exemption which were discovered during the ultrasonic examinations associated with the SSW evaluation.

^{1/}This number reflects 140 visually identified defects and 16 defects identified by ultrasonic examination during the SSW evaluation by the Supply System.

For all future work activities on the Sacrificial Shield Wall excluding those discussed herein and in the previous SSW submittals to NRR, the Supply System will implement normal Project technical controls (recognizing confirmed NRC Region V holds and interface requirements).

Very truly yours,

G. D. Bouchey
Director, Nuclear Safety

Attachment: Hardship Exemption Request

cc w/att: G. Georgiev - NRC, I&E Headquarters
D. Smith - NRC, MTEB
MD Lynch - NRC, DOL
AD Toth - NRC, Resident Inspector - WNP-2
RH Engelken - Director, Region V
JJ Verderber - Burns & Roe, N.Y.
W. Wood - NUS Corporation
ND Lewis - EFSEC, Olympia, Wash.
WS Chin - Bonneville Power Admin.
WNP-2, Files

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SUBJECT: WNP-2 HARDSHIP EXEMPTION REQUEST
WNP-2 SACRIFICIAL SHIELD WALL

STATE OF WASHINGTON)
 : ss
COUNTY OF BENTON)

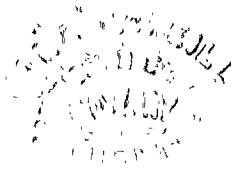
I, G. C. SORENSEN, being duly sworn, subscribe to and say that I am acting for the Director, Nuclear Safety, for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information and belief the statements in it are true.

DATED 2/20, 1981

G. C. Sorensen
G. C. SORENSEN

On this day personally appeared before me G. C. SORENSEN 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 20th day of February, 1981.



Nora McNeill
NOTARY PUBLIC in and for the State
of Washington, residing at: Kennewick



Hardship Exemption Request
For Acceptance As-Is of
Certain Identified Weld Defects
In The WNP-2 Sacrificial Shield Wall in
Violation of AWS D1.1 (Rev. 1-73)

1. Summary

During the reinspection of the WNP-2 Sacrificial Shield Wall (SSW), weld defects were found and identified in the accessible portions of the wall which were in violation of the specified welding code for the SSW, AWS D1.1 (Rev. 1-73). References (1) and (2) discussed in detail the implications of the defects and found that, with incorporation of a replacement girth weld at the 541' elevation construction joint, the design margins in the structure were adequately maintained considering the defects in the wall remained. This was considered by the Supply System to be an adequate disposition of a code nonconformance as allowed by AWS D1.1, paragraph 3.7.6. The Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission, maintained the policy, however, that all identified weld defects in violation of the Code should be brought into conformance with the Code unless specific weld-by-weld hardship exemption was requested by the applicant and approved by the NRC. Such hardship exemptions would have to be on a weld-by-weld basis and have adequate justification to be approved. Accordingly, after a meeting with the NRC on January 22, 1981, where the policy was stated, the Supply System agreed to:

- (1) Repair the identified weld defects to meet the AWS D1.1 Code requirements, or
- (2) Request a hardship exemption to the code with justification on a weld-by-weld basis

In item (2) below are listed the specific hardship exemption requests.

2. Hardship Exemption Requests

A. Requests for Exemption from Visually Discovered Defects

Below are listed five (5) requests for hardship exemption on weld defects in violation of AWS D1.1 visual inspection criteria. In summary, the requests are made since the

defects are, for the most part, of a cosmetic nature and are located in areas of high restraint, where repair could possibly induce more serious defects. It should also be noted that these defects were considered in the engineering assessment of Reference 1, Sections III C and III D.

(1) Weld No. W130-197 Weld Type: O.H. Fillet; 3/8"
Weld Location: EL:559' AZ 318⁰
Type Inspection: VT

Defect Description: Underfill - 1/16" deep for entire weld (30")

Justification for Hardship:

Defective area is highly restrained per criteria of Table 1. It is less than 7" from pipe whip restraint PWS 28-1B. The thickness of material at the location of the defects is 2-1/2".

(2) Weld No.: W3-92 Weld Type: Electroslag Weld

Weld Location: EL: 520' AZ 170⁰

Type Inspection: VT

Defect Description: Porosity - See figure 2 for detail.

Justification for Hardship:

Defective area is highly restrained per criteria of Table 1. Defective area is adjacent to skin plate fillet weld and is approximately 6-1/2" from a pipe whip restraint fillet weld. The thickness of the material at the location of the defect is 1-1/2".

(3) Weld No.: WF 23-87 Weld Type: OH & VERT 5/8" Fillet
Weld Location: EL 530' Az 100°

Type Inspection: VT

Defect Description: Crater fill - one area 1/4" Long x 1/4" wide x 3/32" deep at 100° Az, one area 1/2" long x 1/8" wide x 1/8" deep at 2" to right of 110° Az. Excessive reinforcement - 1/8" height x 4" long at vertical portion of weld.

Justification for Hardship:

Hardship exemption requested on 2 parts of this weld:

1. Zone containing crater fill defect is 1-1/2" from toe of 1-1/2" fillet attaching a pipe whip restraint support. Thickness of material at location of defect is 3/4". It is highly restrained per Table 1.
2. There is no access to a 5" portion of this weld where it passes behind a support member.

(4) Weld No. WF-130-119 Weld Type: HOR: 3/8" Fillet
Weld Location: EL 560' Az 52°

Type Inspection: VT

Defect Description: Overlap - 1/16" height intermittent for entire weld length.

Justification for Hardship:

Hardship exemption requested as contingency if grinding of fillet weld produces undersize condition. Over part of length of weld the toe of W131-238 overlaps buttered area under a pipe whip support column and is within 2" of the butt weld attaching the column to the wall. The thickness of material at the defect location is 1-1/2". This meets criterion for severe restraint in Table 1. In addition, if the undersize situation results, the condition would be enveloped by the engineering assessment of Reference 1.

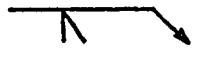
- (5) Weld No.: W23-24 Weld Type: Vertical Electroslag
Weld Location: E1 533' Az 160°
Type Inspection: VT
Defect Description: Porosity - See Figure 3 for detail.
Justification for Hardship:

Repair will possibly require excavation through thickness of electroslag weld to remove porosity. This will require chipping of concrete, fitting of backing plate and rewelding. Also if pores extend along length of weld, skin plates will have to be removed and weld excavated.

The nature of this defect does not warrant repair since the extensive nature of this repair increases risk of generating more serious defects.

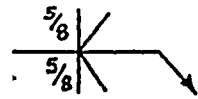
B. Requests for Exemption from Defects discovered through Ultrasonic (UT) Examination

Listed below are ten (10) requests for hardship exemption on sixteen (16) individually numbered welds which were discovered by UT examination of the Sacrificial Shield Wall during the Supply System's investigation of the wall. The defects, being for the most part inaccessible, were subsequently evaluated and considered acceptable based on the justification presented in Reference (1).

(1) Weld No. W4-65 Weld Type:  SMAW
Weld Location: E1 528' Az 330°
Type Inspection: VT, UT
Defect Description: Incomplete penetration in Type C weld. (Figure 1)

Justification for Hardship:

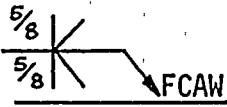
1. Only 12" of weld is accessible - remainder of weld is behind attachments or behind skin plates.
2. Repair would require removing attachments and skin plates, cutting through wall, chipping concrete, installing backing plate and rewelding.
3. Nature of defect does not warrant such extensive rework with potential for creating serious defects.

(2) Weld No. W113-4
W113-6 Weld Type:  FCAW
Weld Location: E1 552' Az 112°

Type Inspection: VT, UT
Defect Description: Incomplete penetration in Type A weld joint. (Figure 1)

Justification for Hardship:


1. Of total weld length of 2'7" only 1'5" is accessible. The remainder is behind a pipe whip restraint.
2. To repair the accessible part it would be necessary to excavate through the wall into the stiffener plate.
3. Nature of the defect does not warrant such extensive rework with a potential for creating serious defects.
4. Access is limited by a main steam line which is 15" from the SSW.

3) Weld No. W113-12
W113-14 Weld Type: 
Weld Location: E1 552' Az 247°
Type Inspection: VT, UT

Defect Description: Incomplete penetration in
Type A weld joint (Figure 1)

Justification for Hardship:

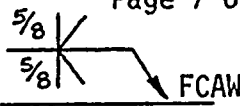
1. Of total weld length 2'7" only 1'5" is accessible. The remainder is behind a pipe whip restraint.
2. To repair the accessible part it would be necessary to excavate through the wall into the stiffener plate.
3. Nature of the defect does not warrant such extensive rework with a potential for creating serious defects.
4. Access is limited by a main steam line which is 15" from the SSW.

(4) Weld No. W102-117 Weld Type: 
Weld Location: E1 551' Az 253°
Type Inspection: VT, UT

Defect Description: Defect is 15" long with a DB rating of +3 which makes it a large reflector per AWS D1.1 for electroslag welds. Defect is located at 1-5/8" from the outside surface of the SSW. See weld type D (Figure 1).

Justification for Hardship:

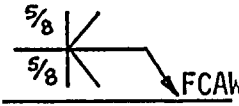
1. Of 20" total length of weld, 16" is accessible. Remainder lies behind skin plates.
2. Defect apparently not in weld but in backing bar.
3. Removal would require cutting through wall and removing skin plates.
4. Nature of defect does not warrant such extensive repair with potential for creating serious defects.
5. Access is limited by main steam line which is 15" from the wall.

(5) Weld No. W114-6
W114-4 Weld Type: 
Weld Location: EL. 552 Az 84°
Type Inspection: VT, UT

Defect Description: Incomplete penetration in
Type A weld joint. (Figure 1)

Justification for Hardship:

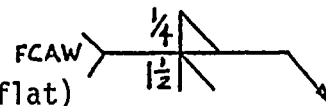
1. Weld is 2'8-1/2" long. Only 12" are accessible.
Remainder is behind a pipe whip restraint.
2. To repair the accessible part it would be necessary
to excavate through the wall into the stiffener
plate.
3. Nature of defect does not warrant such extensive
rework with a potential for creating serious
defects.

(6) Weld No. W114-12
W114-14 Weld Type: 
Weld Location: EL 552' Az 285°
Type Inspection: VT, UT

Defect Inspection: Incomplete penetration in Type A
weld joint (Figure 1)

Justification for Hardship:

1. Weld is 2'8-1/2" long. Only 12" are accessible.
Remainder is behind a pipe whip restraint.
2. To repair the accessible part it would be necessary
to excavate through the wall into the stiffener
plate.
3. Nature of defect does not warrant such extensive
rework with a potential for creating serious
defects.



(7) Weld No. W145-29 Weld Type: Groove (flat)

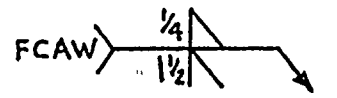
Weld Location: EL '554' Az 240°

Type Inspection: VT, UT

Defect Description: Incomplete penetration in
Type B weld joint. (Figure 1)

Justification for Hardship:

1. Repair would require extensive gouging and grinding with potential for cutting through wall. Rewelding would require extensive preheating of a highly restrained area (per criteria of Table 1).
2. Half of the weld is highly restrained being only 2-1/2" from large pipe whip restraints.
3. Nature of defect does not warrant such extensive repair with potential for creating serious defects.



(8) Weld No: W145-23 Weld Type: _____

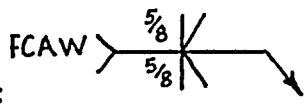
Weld Location: EL '554' Az 120°

Type Inspection: VT, UT

Defect Description: Incomplete penetration in Type B
weld joint (Figure 1)

Justification for Hardship:

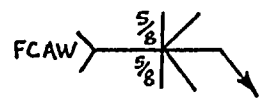
1. Repair would require extensive gouging and grinding with potential for cutting through wall. Rewelding would require extensive preheating of a highly restrained area (per criteria of Table 1).
2. Half of the weld is highly restrained being only 2-1/2" from large pipe whip restraints.
3. Nature of defect does not warrant such extensive repair with potential for creating serious defects.

(9) Weld No. W113-28
W113-30 Weld Type: 
Weld Location: E1 552' Az 264°
Type Inspection: VT, UT

Defect Description: Incomplete penetration in Type A weld joint (Figure 1)

Justification for Hardship:

1. Of 2'6" total length of weld only 1'3" are accessible. The remainder is behind a pipe whip restraint.
2. To repair the accessible part it would be necessary to excavate through the wall into the stiffener plate.
3. Nature of defect does not warrant such extensive rework with a potential for creating serious defects.

(10) Weld No. W113-20
W113-22 Weld Type: 
Weld Location: E1 552' Az 96°
Type Inspection: VT, UT

Defect Description: Incomplete penetration in Type A weld joint (Figure 1)

Justification for Hardship:

1. Of 2'7" total length of weld, only 1'4" are accessible. The remainder is behind a pipe whip restraint.
2. To repair the accessible part, it would be necessary to excavate through the wall into the stiffener plate.
3. Nature of defect does not warrant such extensive rework with a potential for creating serious defects.
4. In addition repair access is limited by a 13" OD vertical pipe running 15" from the SSW.

3. References

- (1) "Engineering Evaluation of the WNP-2 Sacrificial Shield Wall", a report transmitted by letter, D. L. Renberger (WPPSS) to B. J. Youngblood (NRC), subject "Engineering Evaluation of the Sacrificial Shield Wall", letter number G02-80-167, dated August 1, 1980
- (2) "Engineering Evaluation of the WNP-2 Sacrificial Shield Wall, Supplement No. 1", a supplement to Reference (1), transmitted by letter D. L. Renberger (WPPSS) to B. J. Youngblood (NRC), subject "Engineering Evaluation of the Sacrificial Shield Wall (SSW)", letter number G02-80-182, dated August 19, 1980

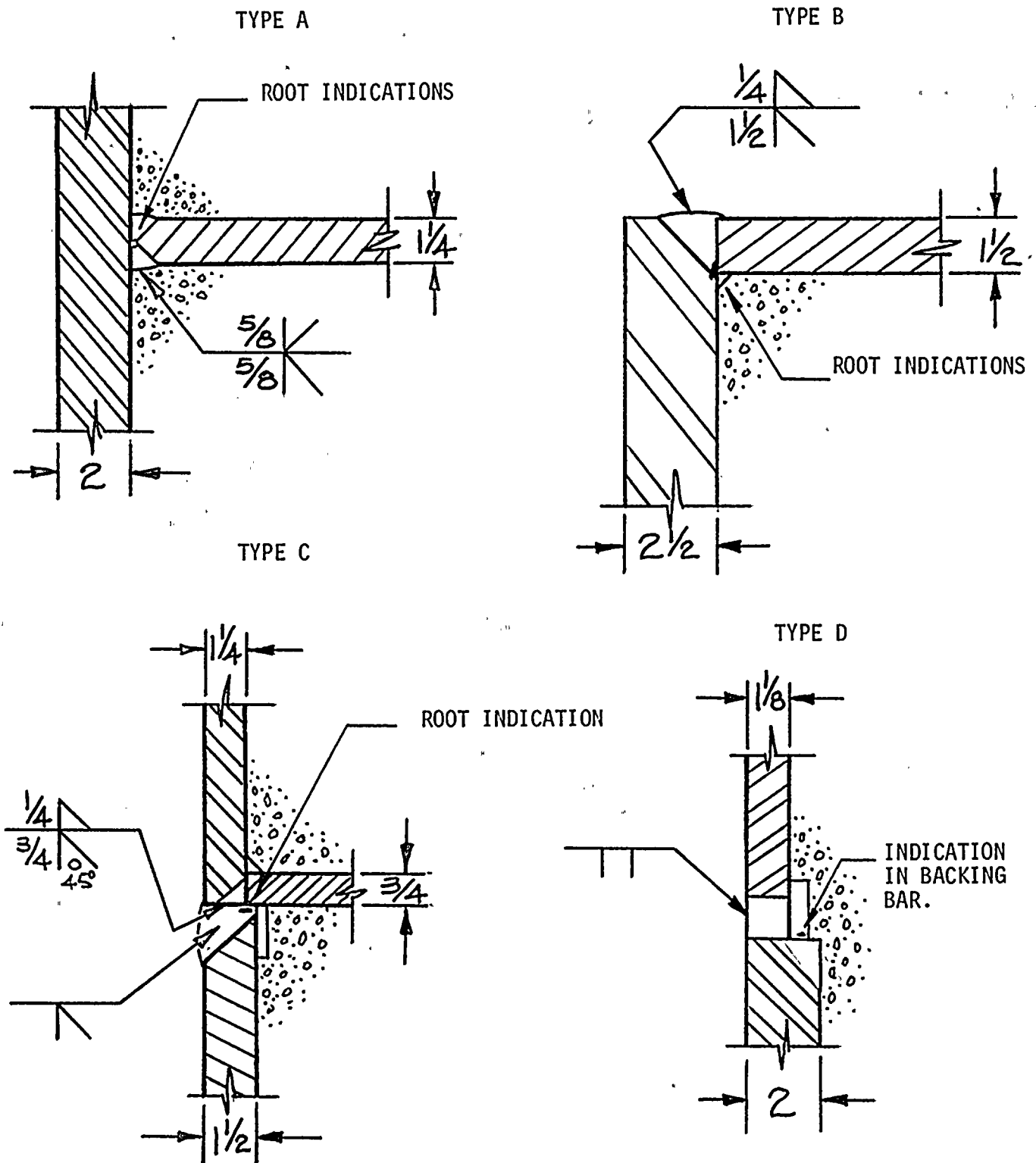
Table 1

Criteria for Hardship Exemption Based Upon Restraint

- o Where severe restraint exists, there is a significant risk that repair of the workmanship defects will lead to additional, more damaging defects such as cracks.
- o The whole SSW is in a condition of some restraint. Severe restraint exists where additional heavy members are welded to the wall.
- o If the workmanship defect lies within a distance of $5T$ (where T is the thickness of the underlying SSW material) from the toe of an attachment weld, then it is considered to lie in a region of high restraint provided the attachment weld is greater than 1" (leg length for fillet; throat for butt weld).
- o The distance of $5T$ was judged to define a zone within which the residual stresses from the attachment will have a potential for affecting the integrity of the repair.

FIGURE 1

CATEGORIES OF WELD JOINTS WHICH
CONTAIN BURIED DEFECTS, DETECTED BY UT



NOTE: STRUCTURAL ACCEPTABILITY OF THESE DEFECTS WAS DETERMINED AND REPORTED
IN REFERENCE #1.

Figure 2
Porosity Detail

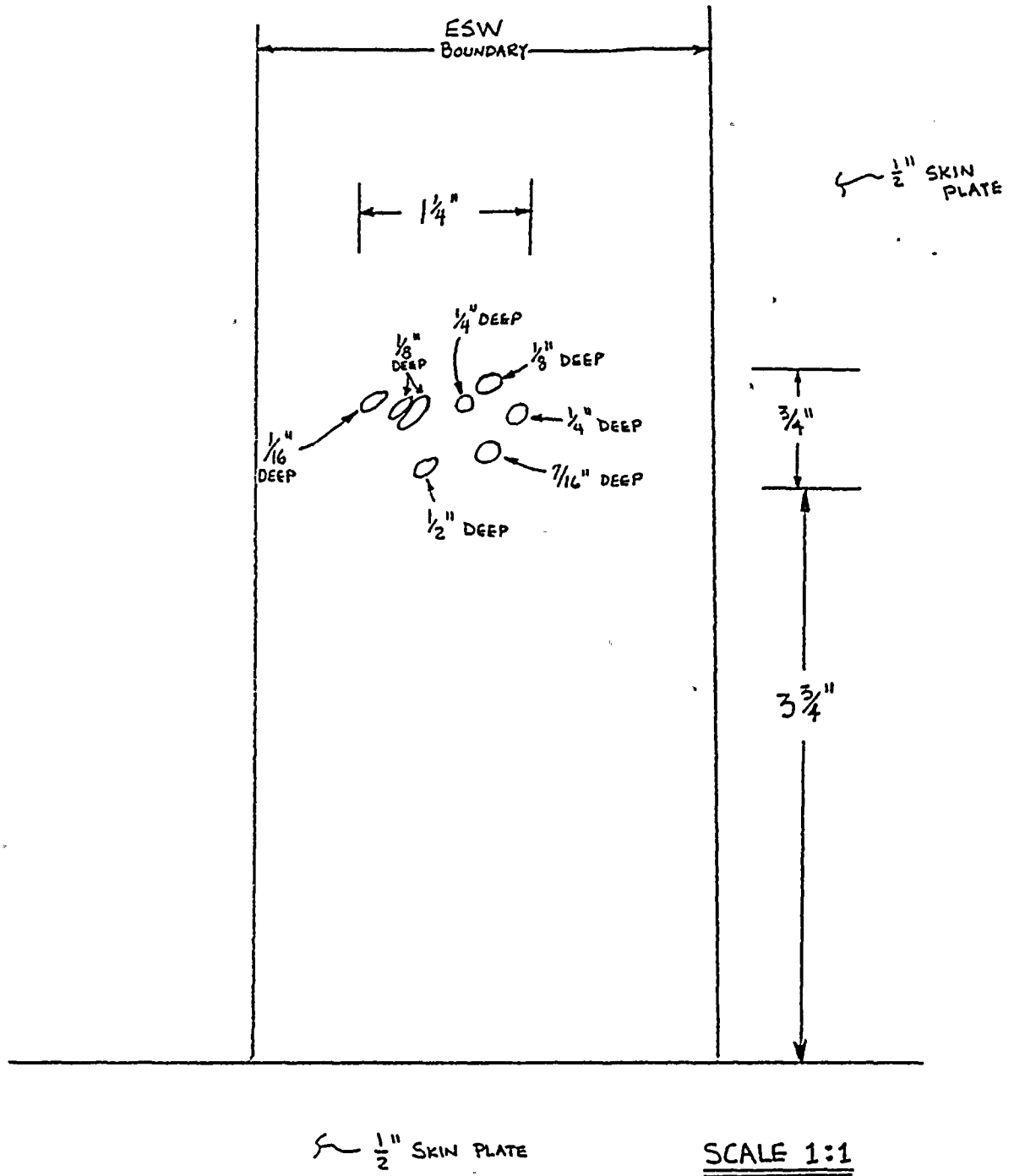


Figure 3
Porosity Detail

