John Richmond

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Sent: Monday, August 18, 2008 11:00 AM
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Cc: Calvin.Taylor@exeloncorp.com
Subject: Drywell Inspection Specification
Attachments: IS-328227-004, Rev 014, 20070516, Functional Requirements fo.pdf

<<IS-328227-004, Rev 014, 20070516, Functional Requirements fo>>

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Specification
IS-328227-004

Specification for Oyster Creek

Functional Requirements for Drywell Containment Vessel Thickness Examinations

Preparation: Peter Tamburro 5/16/07

Reviewed By: Dave Olszewski 5/16/07

Engineering Approval: Howie Ray 5/16/07

Revision 14
May 16, 2007

1.0 Scope

This specification establishes requirements for Non Destructive Examination (NDE) of the Oyster Creek Drywell Containment Vessel. This specification has been revised due to Licensing Renewal Commitments in reference 2.20. The following inspections and examinations are addressed:

1) UT (Ultrasonic Thickness) Examinations at selected locations on the inside of the Drywell at elevation 51' 2"; 51' 10"; 60'10" and 87' 5". The purpose of these examinations is to monitor long term corrosion rates at these elevations. These inspections are required to meet Oyster Creek License Renewal commitment item 7 in reference 2.20 **[CM-1]**.

2) Visual coating inspections (VT-1) of the coating applied on the Drywell Vessel exterior in 1992 in the former sandbed region. Also, Visual Inspections (VT-1) will be performed on the seal/caulking at the junction between the sand bed region concrete/floor and the embedded drywell vessel. The purpose of these inspections is to ensure that the condition of the coating is acceptable and meets Section XI, Subsection IWE requirements. These inspections are required to meet Oyster Creek License Renewal commitment items 2, 4, 12, and 21 in reference 2.20 **[CM-1 and CM-2]**.

3) UT Examinations at selected locations inside the Drywell at elevation 11' 3" (the former sandbed region). The purpose of these examinations is to verify that the external coating is effectively protecting the drywell vessel and that external corrosion is insignificant. These inspections are required to meet Oyster Creek License Renewal commitment items 1 and 21 in reference 2.20 **[CM-1]**.

4) External UT Examinations of locally thin areas in the 10 Sandbed Bays. The purpose of these examinations is to measure locally thin areas that were identified during external inspections in 1992 and 2006. These inspections are required to meet Oyster Creek License Renewal commitment items 9, 14, and 21 in reference 2.20 **[CM-1]**.

5) Inspect the sandbed drains to ensure these lines are not clogged. These inspections will ensure that the sandbed drains are not clogged and water will not collect in the former sandbed region and challenge the coating.

6) UT Examination and visual inspection of the drywell shell within the two trenches inside the drywell on concrete floor (El. 10'-3") in bays 5 and 17. The purpose of these examinations is to verify that internal corrosion is insignificant. These inspections are required to meet Oyster Creek License Renewal commitment items 5, 16 and 20 in reference 2.20 **[CM-1]**.

7) UT Examination of the weld joint at Elevation 23' 6 7/8" in four locations. The purpose of this examination is to provide an indication that the drywell vessel at this weld has not significantly degraded. This UT inspection will be performed through existing internal coating. These inspections are required to meet Oyster Creek License Renewal commitment item 11 in reference 2.20 **[CM-1]**.

8) UT Examination of the weld joint at Elevation 71' 6" in four locations. The purpose of this examination is to provide an indication that the drywell vessel at this weld has not significantly degraded. This UT inspection will be performed through existing coating. These inspections are required to meet Oyster Creek License Renewal commitment item 10 in reference 2.20 **[CM-1]**.

2.0 Reference

Unless otherwise noted, the latest revision applies.

2.1 ASME B&PV Code Section V, 1995 Edition

2.2 ASME B&PV Code Section XI, Subsection IWE, 1992 Edition

2.3 C-1302-187-E310-030 Revision 1, "Statistical Analysis of Drywell Thickness Through September 1996"

2.4 TQ-AA-122, "Qualification And Certification of Nondestructive (NDE) Personnel"

2.5 ER-AA-335-004, "Manual Ultrasonic Measurements of Material Thickness and Interfering Conditions"

2.6 GPUN Sketch, No. SK-S-89

2.7 GPUN Sketch, No. SK-S- 85

2.8 C-1302-187-E310-037 Revision 3, "Statistical Analysis of Drywell Vessel Thickness Data"

2.9 C-1302-187-5320-024, Revision 2, "Drywell External Ultrasonic Testing Evaluation in Sandbed"

2.10 GPUN Drawing 3E-187-29-001, Revision 0, Drywell Shell Stretch-Out".

2.11 ER-AA-335-018, "Detailed General, VT-1, VT-1C, VT-3 and VT-3C, Visual Examination of ASME Class MC and CC Containment Surfaces and Components"

2.12 OCIS-328227-003,"Repair of Concrete Floor Removed in Drywell For UT Readings"

2.13 NRC SER date November 1, 1995 – Changes in the Oyster Creek Drywell Monitoring Program

2.14 ECR 05-00275, Drywell Vessel inspections through 2004.

2.15 License Renewal Commitment Letter –from M.P. Gallagher to NRC dated April 4, 2006 (2130-06-20284)

2.16 ER-OC-330-1006, "First 10 Year Containment (IWE) Inservice Inspection Program Plan and Basis, Draft.

2.17 PBD-AMP-B.1.27, Program Basis Document ASME Section XI, Subsection IWE.

2.18 Deleted

2.19 Commitments

- **CM-1** PASSPORT AR 00330592.27, Oyster Creek Licensing Renewal Commitments Associated with Aging Management Program B.1.27, ASME Section XI, Subsection IWE (Steps 1.0)

- **CM-2** PASSPORT AR 00330592.33, Oyster Creek Licensing Renewal Commitments Associated with Aging Management Program B.1.33, Protective Coating Monitoring and Maintenance Program

2.20 AmerGen Letter 2130-07-20464 to US NRC Date 2/15/2007 "Oyster Creek Licensing Renewal Commitments Associated with Aging Management Program B.1.27, ASME Section XI, Subsection IWE".

2.21 C-1302-187-E310-041 Revision 0, "Statistical Analysis of Drywell Vessel Sandbed Thickness Data 1992, 1994, 1996 and 2006"

3 Requirements

3.1 Non Destructive Examinations

3.1.1 Personnel Qualification

3.1.1.1 Personnel conducting Ultrasonic Examinations shall be qualified in accordance with ER-AA-335-004.

3.1.1.2 Personnel conducting Visual Examinations shall be VT-1 qualified in accordance with ER-AA-335-018.

3.1.2 Examination Procedures

3.1.2.1 NDE UT examinations shall be performed in accordance with ER-AA-335-004 and this specification.

3.1.2.2 Visual Examination of the Drywell Vessel coating on the exterior surface of the former sandbed region and the internal portions of the trenches shall be performed in accordance with ER-AA-335-018.

3.1.3 Methodology and Equipment

The UT examinations performed inside the Drywell shall be performed by one of the following methods:

3.1.3.1 Forty Nine Point Examinations

3.1.3.1.1 For these locations the inspector shall use a stainless steel template fabricated in accordance with Exhibit 2.

3.1.3.1.2 Prior to inspection remove the existing grease that has been previously applied on the area for corrosion protection.

3.1.3.1.3 At each location, the template shall be placed on the drywell vessel so that the notches on the template line up with the low stress die stamps that have been previously stamped on the surface of the drywell. The Inspector shall use a UT transducer that fits within the template within a clearance of 1/16".

3.1.3.1.4 The UT transducer shall be positioned in the same orientation at each grid point. (I.e. the top of the transducer is always positioned to the top template).

3.1.3.1.5 After the UT inspection coat the location with Versilube G351 grease or an approved alternative.

3.1.3.2 Seven Point Examinations

3.1.3.2.1 For these locations the inspector shall use the same stainless steel template fabricated in accordance with Exhibit 2.

3.1.3.2.2 Prior to inspection remove the existing grease that has been previously applied on the area for corrosion protection.

3.1.3.2.3 At each location, the template shall be placed on the drywell vessel so that the notches on the template line up with the low stress die stamps that have been previously stamped on the surface of the drywell. The Inspector shall use a UT transducer that fits within the template within a clearance of 1/16". The inspector shall record only the 7 readings in the middle row.

3.1.3.2.4 The UT transducer shall be positioned in the same orientation at each grid point. (I.e. the top of the transducer is always positioned to the top of the template).

3.1.3.2.5 Use of the template, the UT transducer, and aligning it with the template notches to the stamp on the Drywell ensures that each individual reading is located within a 1/8" of previous readings.

3.1.3.2.6 After the UT inspection coat the location with Versilube G351 grease or an approved alternative.

3.1.3.3 Multiple Point Examinations within the two floor Trenches

3.1.3.3.1 For these two locations the inspector shall use the same stainless steel template fabricated in accordance with Exhibit 2. The template shall be used to locate multiple 7 by 7 grids.

3.1.3.3.2 Within each trench align the template so that the notches on the template line up with the low stress die stamps that have been previously stamped on the surface of the drywell (refer to Exhibit 5). The Inspector shall use a UT transducer that fits within the template within a clearance of 1/16".

3.1.3.3.3 The UT transducer shall be positioned in the same orientation at each grid point. (I.e. the top of the transducer is always positioned to the top of the template). The UT readings shall be taken through the existing coating.

3.1.3.4 Core Bore Locations

The following specific location/grid points have core bore plugs.

Bay Area	Points
11A	**23, 24, 30, 31**
17D	**15, 16, 22, 23**
19A	**24, 25, 31, 32**
19C	**20, 26, 27, 33**
5/D12 (51-D1)	**20, 26, 27, 28, 33, 34, 35**

3.1.4 Inspection Schedule

All inspections required by this specification shall be performed during the scheduled Refueling Outage for the years shown in the table 4. The schedule in Table 4 complies with the latest Oyster Creek License Renewal Commitments documented in reference 2.20 **[CM-1 and CM-2]**.

3.2 Inspections

3.2.1 Internal UT Inspection of Upper Elevations [CM-1]

A total of nine locations are monitored for corrosion rates at elevation 51' 2"; 51' 10"; 60' 10" and 87' 5". Forty-nine individual UT readings shall be recorded at each of the nine locations in accordance with section 3.1.3.1. Table 1 below provides information for each of these locations.

Table 1 – Upper Elevation Inspection Location

Location ID	Bay	Elevation	Original NDE Data sheet	Minimum Acceptance Criteria for each Individual Reading
5/D12 (51-D1)	5	50' 2"	87-026-26	0.607"
5-5 (51-5)	5	50' 2"	87-026-124	0.607"
13/31 (51-13)	13	50' 2"	87-026-126	0.607"
15/23 (51-15)	15	50' 2"	87-026-123	0.607"
13/32 (52-13)	13	51'10"	87-026-144	0.542"
50-22	1	60' 10"	DWCV-R-005	0.539"
9/20 (86-20)	9	87' 5"	87-026-30	0.543"
13/28 (86-28)	13	87' 5"	87-026-37	0.543"
15/31 (86-31)	15	87' 5"	87-026-38	0.543"

3.2.1.1 Acceptance Criteria

With the exception of individual points positioned over core plugs (as documented is section 3.1.3.4) each individual reading less than the minimum value specified in Table 1 shall be entered into the corrective action program and evaluated by Engineering.

The acceptance criteria in Table 1 is based on the minimum recorded readings in 2006 (reference 2.8) and a 20 mil tolerance. The acceptance criteria is not based on the minimum required code thickness, which is less than the above values.

3.2.1.2 Data Retention

All 49 readings values at each location shall be documented on an NDE data sheet and formatted in a 7 by 7 matrix, which corresponds to the template. The data sheet shall also include: the date and time of the examination, location of core plugs (if applicable), the examination method, the ID number of the equipment, the ID number of the cal block, the location surface temperature, Examiner, Reviewer, the governing procedure, Location ID in accordance with Table 1. Forward the completed data sheets to Engineering.

3.2.1.3 Required Support and Tools

3.2.1.3.1 In order to provide access to the three inspection locations at elevation 87' 5", temporary planking shall be provided as necessary at the top of the biological shield extending to the drywell wall.

3.2.1.3.2 Deleted

3.2.1.3.3 Prior to the UT inspection of each location remove the existing grease that was applied after the last inspection shall be removed.

3.2.1.3.4 After the UT inspection coat the location with Versilube G351 grease or an approved alternative.

	DOCUMENT NO.
	IS-328227-004

TITLE Functional Requirements For Drywell Containment Vessel Thickness Examinations

REV	SUMMARY OF CHANGE	APPROVAL	DATE
13	A complete revision resulting from commitments to the NRC for Oyster Creek Licensing Renewal life extension from 2009 to 2029. Revision 13 now provides requirements for the following: 1. UT Examinations at selected locations on the inside of the Drywell at elevation 51' 2"; 51''10"; 60'10" and 87' 5". These inspection were previously performed on a 4 year interval. However new acceptance criteria has been established for entering results into the Corrective Action System. 2. Visual coating inspections of the coating applied on the Drywell Vessel in 1992 in the former sandbed region. These inspections were previously performed on a 4 year interval. However new acceptance criteria has been established for entering results into the Corrective Action System. In addition the inspection reflects addition commitments to perform a complete 100% inspection of all bays by 2009 and a complete 100% during the period of extended operation between 2009 and 2029. 3. UT Examinations at selected locations on the inside of the Drywell at elevation 11' 3" (the former sandbed region). These inspections were previously performed in various intervals until 1996 at time which GPUN received approval from the NRC discontinue the inspections. However new licensing renewal commitments have been made to perform a complete 100% inspection of all bays by 2009 and an additional complete 100% inspection during the period of extended operation between 2009 and 2029. Also, acceptance criteria has been established for entering results into the Corrective Action System. 4. External Inspection and UT Examinations of 16 locally thin areas in Bays 1 and 13. This is a new licensing renewal commitment which is a one time inspection to be performed prior to the 2009. 5. Inspection of the five sandbed drains to ensure these lines are not clogged. This is not a commitment. However it is considered prudent measure to ensure the drain lines are not clogged. 6. UT Examination and visual inspection of the drywell shell within the two trenches inside the drywell on concrete floor (El. 10'-3") in bays 5 and 17. This is a new licensing renewal commitment that shall be performed once prior to the 2009.	Preparer - Peter Tamburro Reviewer – Charles Schilling Manager - Howie Ray	

	7. UT Examination of a welds at Elevation 23' 6". This is a new licensing renewal commitment, which shall be performed once prior to the 2009 and once during the period of extended operation. 8. UT Examination of a weld at Elevation and 71'6". This is a new licensing renewal commitment, which shall be performed once prior to the 2009 and once during the period of extended operation.		
14	A complete revision resulting from commitments to the NRC for Oyster Creek Licensing Renewal life extension from 2009 to 2029 as documented in AmerGen Letter 2130-07-20464 (reference 2.20). Also, this revision incorporates lessons learned from the 1R21 Inspections	Preparer - Peter Tamburro Reviewer – Dave Olszewski Manager - Howie Ray	5/16/07 5/16/07 5/16/07

3.2.2 Internal UT Inspection of Former Sandbed Region Elevations [CM-1]

3.2.2.1 Description

A total of 19 locations are monitored for corrosion rates at elevation 11' 3". Individual UT readings shall be recorded at each location in accordance with section 3.1.3.1 and 3.1.3.2. Table 2 below provides information for each of these locations.

Table 2– Sandbed Elevation Inspection Location

Location ID	No of points	Bay	Elevation	Original NDE Data sheet	Average Thickness based on 1994 Inspections (inches)	Average Thickness based on 1996 Inspections (inches)	Average Thickness based on 2006 Inspections (inches)
9D	49	9	11' 3"	87-026-59	0.992	1.008.	0.993
11A	49	11	11' 3"	87-049-24	0.820	0.830	0.822
11C	49	11	11' 3"	87-049-37	0.894	0.951	0.898
13A	49	13	11' 3"	87-026-58	0.837	0.853	0.846
13D	49	13	11' 3"	87-026-67	0.959	0.990	0.968
15D	49	15	11' 3"	87-026-58	1.053	1.066	1.053
17A	49	17	11' 3"	87-026-58	1.017	1.058	1.015
17D	49	17	11' 3"	87-049-26	0.810	0.848	0.818
17/19	49	17	11' 3"	87-026-66	0.970	0.980	0.969
19A	49	19	11' 3"	87-049-27	0.806	0.815	0.807
19B	49	19	11' 3"	87-049-28	0.824	0.837	0.847
19C	49	19	11' 3"	87-049-29	0.820	0.854	0.824
1D	7	1	11' 3"	87-026-54	1.101	1.151	1.122
3D	7	3	11' 3"	87-026-55	1.184	1.175	1.180
5D	7	5	11' 3"	87-026-56	1.168	1.173	1.185
7D	7	7	11' 3"	87-026-57	1.136	1.138	1.133
9A	7	9	11' 3"	87-026-60	1.157	1.155	1.154
13C	7	13	11' 3"	87-026-61	1.140	1.154	1.142
15A	7	15	11' 3"	87-026-62	1.114	1.127	1.121

3.2.2.2 Acceptance Criteria

3.2.2.2.1 With the exception of individual points positioned over core plugs each of the 49 individual readings less than 0.628" shall be

entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on the minimum recorded readings in 2006 (reference 2.21) and a 20 mil tolerance. This acceptance criteria is not based on the minimum required code thickness, which is less than the above value.

3.2.2.2.2 In addition Engineering shall calculate the average value of each location consistent with reference 2.3. The calculated average for each location shall be within +/- 0.020" of the values documented in table 2. Values not within +/- 0.020" shall be entered into the corrective action program and evaluated by Engineering and shall be subject to the following actions:

- Perform additional UT measurements to confirm the readings. Notify NRC within 48 hours of confirmation of the identified condition
- Conduct visual inspection of the external surface in the sad bed region in areas where any unexpected corrosion may be detected.
- Perform engineering evaluation to assess the extent of the condition and to determine if additional inspections are required to assure drywell integrity.
- Perform operability determination and justification for continued operation, in accordance with plant procedures, until next scheduled inspection.

3.2.2.3 Data Retention

Values at each location shall be documented on an NDE data sheet and formatted in either a 7 by 7 or a 1 by 7 matrix, which corresponds to the template. The data sheet shall also include: the date and time of the examination, location of the core plugs, the examination method, the ID number of the equipment, the governing procedure, the ID number of the cal block, the location surface temperature, Examiner, Reviewer,

Location ID in accordance with table 2. Forward the completed data sheets to Engineering.

3.2.2.4 Required Support and Tools

3.2.2.4.1 Deleted

3.2.2.4.2 Prior to the UT inspection of each location remove the existing grease (with an approved cleaner), which was previously applied after the last inspection.

3.2.2.4.3 After the UT inspection coat the location with Versilube G351 grease or an approved alternative.

3.2.3 External UT Inspection of Locally Thin Areas in all Sandbed Bays [CM-1]

3.2.3.1 Description

3.2.3.1.1 Locate and perform UT Inspection of locally thin areas found during the external inspection of the Drywell in 1992 and 2006, These areas were identified in 1992 on NDE data sheets 92-072-01 through 92-072-26 and were located and inspected in 2006. The 2006 inspections results are documented on NDE datasheets 1R21LR-003, 004, 007, 009, 011, 013, 014, 016, 017, and 018 (Exhibit 7). Perform the UT inspection through the coating. Select UT equipment that is capable of subtracting the coating thickness from the vessel wall thickness.

3.2.3.1.2 The inspections shall capture the thinnest reading within the each area consistent with the results of the 2006 inspections.

3.2.3.1.3 The 2006 NDE datasheets 1R21LR-003, 004, 007, 009, 011, 013, 014, 016, 017, and 018 provide the location of each area (Exhibit 7). In addition the locations were marked during the 2006 inspections

3.2.3.1.4 After each UT inspection is performed, ensure the area remains permanently marked so that the same area can be easily located in future inspections.

3.2.3.2 Acceptance Criteria

Readings less than 0.582" shall be entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on the minimum recorded reading in 2006 (reference 2.21) and a 20 mil tolerance. Acceptance criteria is not based on the minimum required code thickness, which is less than the above value.

3.2.3.3 Data Retention

UT readings for each location shall be documented on an NDE data sheet. The data sheet shall also include: the date and time of the examination, the examination method, the ID number of

the equipment, the governing procedure, the ID number of the cal block, the location surface temperature, Examiner, Reviewer, Location ID in accordance with Table 3. Forward the completed data sheets to Engineering.

3.2.3.4 Required Support and Tools

3.2.3.4.1 Deleted.

3.2.3.4.2 The cavity in the former sandbed region is a confined space.

3.2.3.4.3 To provide access to the cavity in the former sandbed region, the station shall remove the sandbags and boron bags that fill each access man way.

3.2.3.4.4 After inspections per sections 3.2.3 and 3.2.4 are completed the station shall reinstall the sandbags and boron bags in each man way, unless this configuration has been replaced with a manway cover per an approved configuration change.

3.2.4 External Visual Inspection of the Sandbed Coating [CM-1 and CM-2]

3.2.4.1 Description

3.2.4.1.1 The external coating that was applied in 1992 to the Drywell Vessel shall be inspected in accordance with ER-AA-335-018 and ASME Section XI subsection IWE.

3.2.4.1.2 Inspect exterior surfaces of the drywell for water and the concrete floor for ponding or standing water.

3.2.4.1.3 The entire surface from the base of the sand bed region concrete floor (El. 8' 11") to the top where the vessel rises into the 3" gap (El. 12' 3") shall be visually (VT-1) inspected. In the horizontal direction the inspection of one bay shall constitute all surfaces within 16 feet centered on the vent line (see Exhibit 3).

3.2.4.1.4 The inspection shall include a visual inspection of the caulking that was applied in 1992 at the interface between the former sandbed concrete floor and the drywell vessel (see Exhibit 4).

3.2.4.1.5 The inspection shall also identify cracks on the sandbed floor at the interface between the epoxy grout used in 1992 to rebuild the floor and the original concrete floor or walls. Similar cracks were identified in the 2006 inspections. These cracks were sealed with a sealant in 8 of the 10 bays during the 2006 outage. The inspection shall include a visual inspection of the sealant installed in 2006.

3.2.4.2 Acceptance Criteria

3.2.4.2.1 Refer to Attachment 2 of procedure ER-AA-335-018. All surface areas with flaking, chipping, blistering, peeling, pinpoint rusting, cracking, chalking and discoloration

attributable to rust blooms shall be entered into the Corrective Action Program and evaluated by Engineering.

3.2.4.2.2 The caulking at the base of the Drywell shall be free of chipping, peeling, and cracking. Deviation shall be entered into the Corrective Action Program and evaluated by Engineering.

3.2.4.2.3 The sealant in the floor cracks (installed in 2006) shall be free of chipping, peeling, and cracking. Deviation shall be entered into the Corrective Action Program and evaluated by Engineering.

3.2.4.2.4 Discoloration due to loose surface residue from surface wetting is acceptable so long as the coating below the residue has not degraded.

3.2.4.2.5 Minor flaking, chipping and peeling of the epoxy coating and caulking is acceptable. Minor flaking, chipping and peeling is defined as follows: isolated flaking, chipping and peeling where: the loose coating is less than a ¼ square inch, is on the surface of the coating or caulking and does not penetrate to the base metal. The purpose of this exception is to allow minor physical damage that may have been caused by personnel moving around in the sand bed region and is not indicative of a coating or caulking breakdown.

3.2.4.2.6 Documentation of degraded areas shall include the location of the area (i.e. X inches from the vertical weld and Y inches from the downcomer penetration weld), the size of the area, and the specific degradation. A color picture of degraded areas shall be taken and provided to Engineering.

3.2.4.2.7 Document bays where ponding or standing water, if any, was observed.

3.2.4.3 Data Retention

Inspections shall be documented for each bay on an NDE data sheet. The data sheets shall also include: the date and time of the examination, the examination method, the governing procedure, Examiner, and Reviewer.

3.2.4.4 Required Support and Tools

3.2.4.4.1 Deleted

3.2.4.4.2 The cavity in the former sandbed region is a confined space.

3.2.4.4.3 The field shall also remove the sandbags and boron bags that fill each man way.

3.2.4.4.4 After Inspections per sections 3.2.3 and 3.2.4 are completed the station shall reinstall the sandbags and boron bags in each man way, unless this configuration has been replaced with a manway cover per an approved configuration change.

3.2.5 Sandbed Drain Line Inspection

3.2.5.1 Description

The former sandbed cavity has five drain lines equally spaced around the sandbed (see Exhibit 4). The purpose of these drains is to drain the cavity should water be introduced into the former sand bed cavity. The drains exit the Drywell Pedestal at the base of the Pedestal in the Torus Room. Inspect these drains with a boroscope type video system to ensure they are not clogged. These drain lines shall be inspected on a frequency required on Table 4.

3.2.5.2 Acceptance Criteria

Each drain line shall be free of blockage. Minor amounts of blockage (less than 15% of the cross sectional area) are acceptable. Lines with unacceptable blockage shall be entered in to the Corrective Action Program.

3.2.5.3 Data Retention

Inspections shall be documented for each line on an NDE data sheet or in the PIMS Work Order including blockage less than 15%. The data sheets or PIMS Work Order shall also include:

the date and time of the examination, the examination method, Examiner, and Reviewer.

3.2.5.4 Required Support and Tools

3.2.5.4.1 Deleted

3.2.5.4.2 The cavity in the former sandbed region is a confined space.

3.2.6 Trench Visual and UT Examination [CM-1]

3.2.6.1 Description

3.2.6.1.1 Background

In the mid 1980's two trenches were cut out of the Drywell floor at elevation 10' 3". The purpose of these trenches was to allow UT inspection of the Drywell Vessel below the removed concrete. The inspection results were captured on NDE data sheets 86-049-047 and 86-049-056 (reference 2.7). These trenches were then filled by the installation of a foam material (reference 2.11). In 2006 these trenches were opened by removing the foam and then visually inspected. The inspections found standing water in the bay 5 trench and the coating of the drywell vessel in both trenches was in poor condition. The coating was removed and the vessel was UT inspected. In addition the trench in bay 5 was slightly enlarged to allow inspection of an additional 6" at the bottom. This 6" area was then grouted over after the inspection. The results were documented in NDE data sheets 1R21LR-023, 024, 025, 031, 032, 037, and 038. After the UT inspections the vessel surfaces in the trenches were coated with Versilube G351 grease or an approved alternative.

3.2.6.1.2 Perform the following inspections:

1) Inspect the trenches for water. If water is found then enter this condition into the corrective action system. Document the amount (level) of water and possible sources of the water. Chemistry shall sample the water.

2) Inspect the caulk sealant installed in 2006 on the edges of the trenches where the concrete meets the Drywell Vessel.

3) Remove the protective grease on the Drywell Vessel.

4) Perform UT inspections in each trench consistent with the scope and method of the 2006 inspections and Exhibit 5. The Drywell Vessel surface in both trenches has been permanently marked. Line up the notches on the template with the low stress die stamps (refer to Exhibit 5).

5) In the bay 5 trench remove the lower 6 inches of grout installed in 2006. Expose an additional 6" of vessel surface consistent with the area exposed in 2006 as shown in NDE data sheet 1R21LR-031. Re-grout as required to allow resealing concrete to the shell surfaces.

3.2.6.2 Acceptance Criteria

3.2.6.2.1 Visual Inspection Acceptance Criteria

3.2.6.2.1.1 Refer to attachment 2 of procedure ER-AA-335-018. All surface areas with flaking, chipping, blistering, peeling, pinpoint rusting, cracking, chalking, and discoloration attributable to rust blooms shall be entered into the Corrective Action Program and evaluated by Engineering.

3.2.6.2.2 Vessel Thickness Acceptance Criteria

Readings less than 0.682" shall be entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on the minimum recorded readings in 2006 (reference NDE data sheet1R21LR-024 and 025), a 20 mil tolerance. The acceptance criteria are not based on the minimum required code thickness, which is less than the above value.

3.2.6.3 Data Retention

3.2.6.3.1 Visual inspections shall be documented for each Trench on an NDE data sheet. The data sheets shall also include: the date and time of the examination, the examination method, the governing procedure, Examiner, and Reviewer.

3.2.6.3.2 All UT readings values within each trench shall be documented on an NDE data sheet and formatted in a 7 column format similar to NDE data sheets 1R21LR-023 and 025 . The data sheets shall clearly identify the order of each grid from the top to bottom. The data sheet shall also include: the date and time of the examination, location of the core plugs, the examination method, the ID number of the equipment, the governing procedure, the ID number of the cal block, the location surface temperature, Examiner, Reviewer, Location ID in accordance with table 2.

3.2.6.4 Required Support and Tools

3.2.6.4.1 Deleted

3.2.6.4.2 Remove the existing protective grease .

3.2.6.4.3 Remove a small portion of concrete/grout in the bottom of the bay 5 to expose an additional 6" of Drywell Vessel surface. The amount of surface shall be approximately the same as the surface area exposed in 2006. Refer to NDE data sheet 1R21LR-031

3.2.7 After the UT inspection are complete coat the location with Versilube G351 grease or an approved alternative.

3.2.7 UT Inspection of Weld Joint at Elevation 23' 6 7/8" [CM-1]

3.2.7.1 Background

At elevation 23' 6 7/8" there is a circumferential weld which joins the bottom spherical plates and the middle spherical plates. This weld joins plates that are 1.154" thick to the plates that are 0.770" thick. The edges of the 1.154 thick plates were fabricated with a taper to provide a smooth transition to the thinner plates.

3.2.7.2 Locations

3.2.7.2.1 Four separate locations shall be inspected per the requirements of section 3.2.7.3. This shall include repeat inspection of the two locations in bays 15 and 17 inspected in 2006 (NDE data sheet 1R21R029 and 030).

3.2.7.2.2 This weld joint is located at nearly the same elevation as the grating at elevation 23' 6". The 1.154 thick plates are located below the grating. The "as built" drawings do not provide enough information to determine if there is enough clearance between the grating and the side of the Drywell to allow NDE inspectors access to the lower plates. Therefore the inspection locations will be selected by the NDE and Engineering, based on accessibility to the lower plate. To the extent possible the inspection locations shall be selected within Bays 13, 15, 17, 19 and or 1. These bays have historically experienced the most corrosion in the sandbed region. If necessary portions of the grating may have to be removed. Since the 2006 inspection were performed in bays 15 and 17, the two new 2008 locations should be, to the extent possible, selected from bays 13, 19, and 1.

3.2.7.3 Inspection Requirements

3.2.7.3.1 Inspection of the 1.154" Plate

3.2.7.3.1.1 Dynamic UT inspections of the 1.154" thick plate shall be performed

through the existing coating below the taper (see Exhibit 6). Dynamically scan an area that is a nominally of 6" wide by 6" high. Record the average and maximum thickness. Also characterize and document all areas within this 6" by 6" area that are less than 0.96 inches thick.

3.2.7.3.1.2 During this first inspection, mark this area with a low stress dye stamp so that repeat inspections can be performed in the future. This shall be accomplished by marking two corners of the 6" by 6" area.

3.2.7.3.1.3 If UT inspection (per the above paragraphs) of the 1.154" thick plate cannot be performed due to interference between the grating and the side of the drywell and if the grating cannot be easily removed, document the discrepancy into the Corrective Action Process for evaluation by Engineering.

3.2.7.3.2 Inspection of the 0.770" plate

3.2.7.3.2.1 Dynamic UT inspections of the 0.770" plate shall be performed through the existing coating above the weld. Dynamically scan an area that is a nominally of 6" wide by 6" high (see Exhibit 6). Record the average and maximum thickness. Also characterize and document all areas within this 6" by 6" area that are less than 0.740 inches thick.

3.2.7.3.2.2 During the first inspection, mark this area with a low stress dye stamp so that repeat inspections can be performed in the future. This shall be accomplished by marking two corners of the 6" by 6" area.

3.2.7.3.3 Inspection of the Weld

3.2.7.3.3.1 Dynamic UT thickness inspection of the weld between the two 6" x 6" areas described above. Grind the weld crown flat if necessary. 100% of the weld area shall be inspected.

3.2.7.3.3.2 Review of the original construction drawings for the drywell vessel (CBI drawing 9-0971 sheet 4, details "Joint R", "Joint D" and "Joint E") show that this weld was required to be flush. Therefore, most likely "Flat Top" process will not be required. However, it is possible the weld may have slight crown that was not completely flush. In this case the Flat Top process will simply remove the slight crown.

3.2.7.3.3.3 After the UT inspection is complete and if weld has been "Flat Topped" coat the exposed weld location with Versilube G351 grease or an approved alternative.

3.2.7.4 Acceptance Criteria

3.2.7.4.1 On the 0.770" thick plate and the weld, readings less than 0.628" shall be entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on the minimum recorded local readings found during the 2006 inspections (reference 2.21) and a 20 mil tolerance. This acceptance criteria is not based on the minimum required code thickness, which is less than the above value.

3.2.7.4.2 On the 1.154" thick plate readings less than 0.847" shall be entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on the minimum recorded local

readings found during the 2006 inspections (NDE Data sheet 1R21LR-029) and a 20 mil tolerance. This acceptance criteria is not based on the minimum required code thickness, which is less than the above value.

3.2.7.5 Data Retention

All readings and areas sizes for each location shall be documented on an NDE data sheet. In addition the location of the inspected area shall be clearly documented so that this same location can be inspection in the future. The data sheet shall also include: the date and time of the examination, the examination method, the ID number of the equipment, the governing procedure, the ID number of the cal block, the location surface temperature, Examiner, Reviewer, Location ID in accordance with table 3.

3.2.7.6 Required Support and Tools

3.2.7.6.1 Deleted

3.2.7.6.2 The weld in the area may be ground flat prior to the inspection.

3.2.8 UT Inspection of Weld Joint at Elevation 71' 6" [CM-1]

3.2.8.1 Background

At elevation 71' 6" there is circumferential weld which joins the transition plates (referred to as the knuckle) between the cylinder and the sphere. This weld joins the knuckle plates, which are 2 5/8" thick to the cylinder plates, which are 0.64" thick. The edges of the 2 5/8" thick plates were fabricated with a 3 to 12 taper to provide a smooth transition to the thinner plates.

3.2.8.2 Locations/Scaffolding

3.2.8.2.1 Four separate locations shall be inspected per the requirements of section 3.2.8.3. This shall include repeat inspection of the two locations in bays 15 and 19 inspected in 2006 (NDE data sheet 1R21R033 and 034).

Inspection of this weld joint in four locations will require the erection of scaffolding from the drywell platform at elevation 47'. The inside of the Drywell at this elevation is very congested. Therefore the NDE, Engineering, and the trade that will erect the scaffolding will select the actual location. This will ensure that the inspection and scaffolding erection will be performed safely. To the extent possible the inspection locations shall be selected within Bays 13, 15, 17, 19 and or 1. These bays have historically experienced the most corrosion in the sandbed region. Since the 2006 inspections were performed in bays 15 and 19, the two new 2008 locations should be, to the extent possible, selected from bays 13, 17, and 1.

3.2.8.3 Inspection Requirements

3.2.8.3.1 Inspection of the 2 5/8" plate

3.2.8.3.1.1 Dynamic UT inspections of the 2 5/8" thick plate shall be performed

through the existing coating below the taper on the plate (see Exhibit 6). Dynamically scan an area that is a nominally of 6" wide by 6" high. Record the average and maximum thickness. Also characterize and document all areas within this 6" by 6" area that are less than 2.55 inches thick.

3.2.8.3.1.2 During this first inspection, mark this area with a low stress dye stamp so that repeat inspections can be performed in the future. This shall be accomplished by marking two corners of the 6" by 6" area.

3.2.8.3.2 Inspection of the 0.64" plate

3.2.8.3.2.1 Dynamic UT inspections of the cylinder plate shall be performed through the existing coating above the weld. Dynamically scan an area that is a nominally of 6" wide by 6" high. Record the average and maximum thickness. Also characterize and document all areas within this 6" by 6" area that are less than 0.585 inches thick.

3.2.8.3.2.2 During this first inspection, mark this area with a low stress dye stamp so that repeat inspections can be performed in the future. This shall be accomplished by marking two corners of the 6" by 6" area.

3.2.8.3.3 Inspection of the weld

3.2.8.3.3.1 Dynamic UT thickness inspection of the weld between the two 6" x 6" areas described above. Grind the weld crown flat if necessary. 100% of the weld area shall be inspected.

3.2.8.3.3.2 Review of the original construction drawings for the drywell vessel (CBI drawing 9-0971 sheet 4, details "Joint R", "Joint D" and "Joint E") show that this weld was required to be flush. Therefore, most likely "Flat Top" process will not be required. However, it is possible the weld may have slight crown that was not completely flush. In this case the Flat Top process will simply remove the slight crown.

3.2.8.3.3.3 After the UT inspection is complete and if weld has been "Flat Topped" coat the exposed weld location with Versilube G351 grease or an approved alternative.

3.2.8.4 Acceptance Criteria

3.2.8.4.1 On the cylinder plate (nominally 0.64") and the weld, readings less than 0.429" shall be entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on minimum recorded readings found during the 2006 inspections (NDE Data sheet 1R21LR-033) and a 20 mil tolerance. This acceptance criteria is not based on the minimum required code thickness, which is less than the above value.

3.2.8.4.2 On the knuckle plate (nominally 2 5/8") readings less than 2.408" shall be entered into the corrective action program and evaluated by Engineering. This acceptance criteria is based on minimum recorded

readings during the 2006 inspections (NDE Data sheet 1R21LR-033) and a 20 mil tolerance. This acceptance criteria is not based on the minimum required code thickness, which is less than the above value.

3.2.8.5 Data Retention

All readings and areas sizes for each location shall be documented on an NDE data sheet. In addition the location of the inspected area shall be clearly documented so that this same location can be inspected in the future. The data sheet shall also include: the date and time of the examination, the examination method, the ID number of the equipment, the governing procedure, the ID number of the cal block, the location surface temperature, Examiner, Reviewer, Location ID in accordance with table 3.

3.2.8.6 Required Support and Tools

3.2.8.6.1 Deleted.

3.2.8.6.2 To provide access to this welded joint, the station must erect scaffolding from elevation 47'.

3.2.8.6.3 The weld in the area may be ground flat prior to the inspection.

3.2.8.6.4 Remove the scaffolding.

4 Quality Assurance

4.1 The following work shall be performed in accordance with the Exelon Quality Assurance Program as follows:

4.1.1 UT and Visual Inspection shall be performed in accordance with approved procedures as described in section 3.1.2 and this specification.

4.1.2 UT inspections for sections 3.2.1, 3.2.2 and 3.2.3 shall be performed with a template that meets the dimensional requirements in Exhibit 2 of this specification.

4.1.3 Resulting calculation(s) shall be developed and approved in accordance with Exelon approved procedures

Table 4 – Inspection Schedule [CM-1 and CM-2]

Inspection	2006	2008	2010	2012	2014	2016	2018	2020	2022	2024	2026	2028
Internal UT Inspection in upper elevations per section 3.2.1	Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations	
Internal UT Inspection in sandbed region per section 3.2.2	Yes – all locations	Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations
External UT Inspection of Locally Thin Areas in the Sandbed per section 3.2.3	Yes – all locations	Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations		Yes – all locations
Visual inspection of Former Sandbed coating per section 3.2.4	Yes – All Bays	Yes – All Bays		Yes – All Bays		Yes – All Bays		Yes – All Bays		Yes – All Bays		Yes – All Bays
Inspection of Sandbed drain lines per section 3.2.5	Yes – all					Yes – all locations					Yes – all ations	
Internal UT Inspection in Trenches per section 3.2.6	Yes – Bay 5 and 17	Yes – Bay 5 and 17	Yes – Bay 5 and 17 ***Note 1**									
Internal Visual Inspection in Trenches per section 3.2.6	Yes – Bay 5 and 17	Yes – Bay 5 and 17	Yes – Bay 5 and 17 ***Note 1**									
UT Inspection of Weld Joint at Elevation 23' 6 7/8" per section 3.2.7	Yes – 2 Locations	Yes – 2 New Locations and 2 Repeat locations		Yes –4 Repeat locations **Note*2**								
UT Inspection of Weld Joint at Elevation 71' 6" per section 3.2.8	Yes – 2 Locations	Yes – 2 New Locations and 2 Repeat locations		Yes –4 Repeat locations **Note*2**								

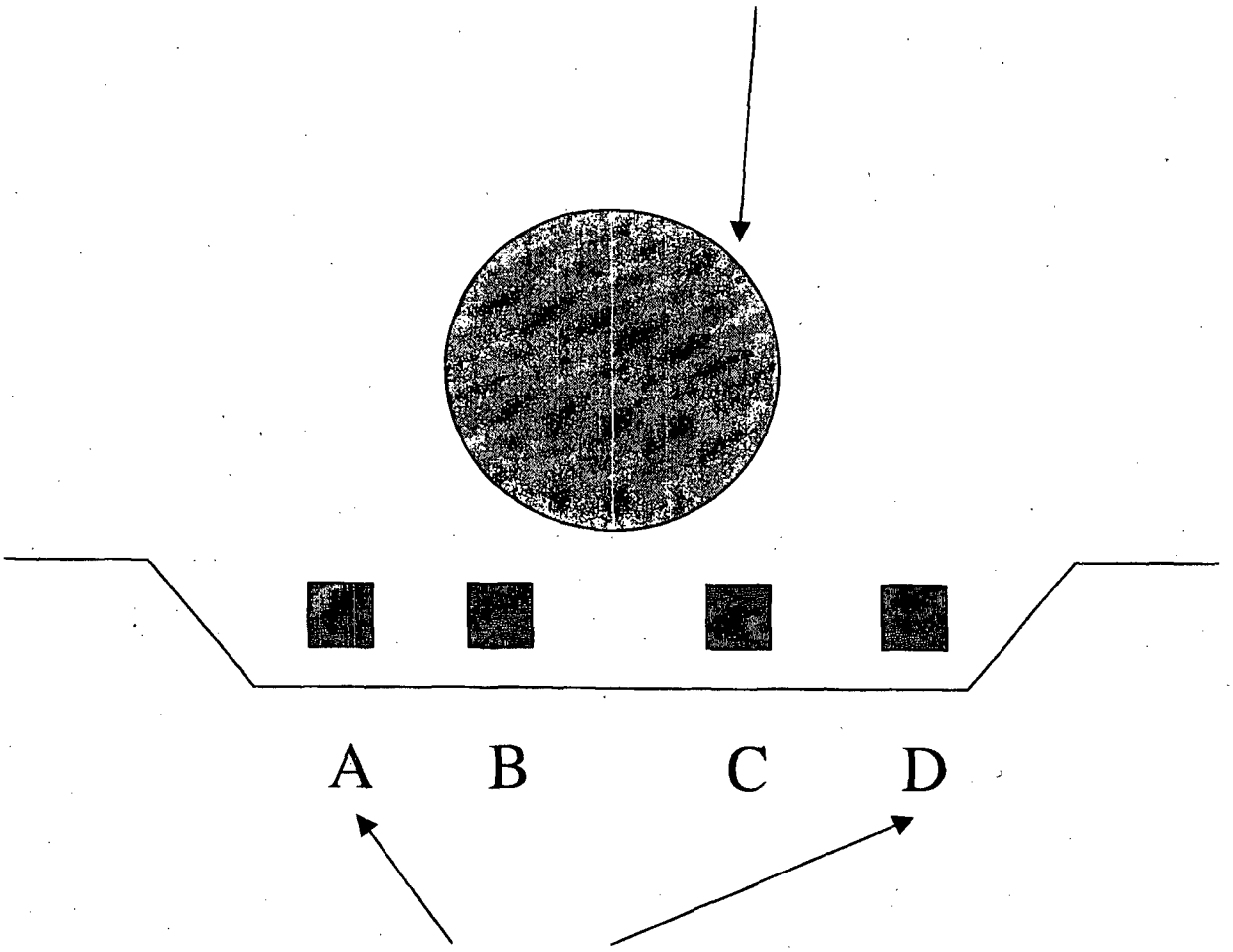
Note *1 - Termination of the trench inspections after 2010 assumes that no water is found in the trenches in the 2008 and 2010 refueling outages, and the NRC provides approval prior to the planning deadline for the 2012 outage in which case the trenches will be refilled with concrete. **[CM-1]**

Note *2 - Inspections at these locations will continue on an every-other-outage frequency if the corrosion rates at these locations are not bounded by rates identified through inspections of the upper drywell. **[CM-1]**

Exhibit 1

Typical Orientation of Inspection Locations in the Sandbed Region

View - looking from inside the drywell



Location IDs = Bay Number plus one of these letters: i.e. – "11D"

Exhibit 2

Template shall be made of Stainless Steal, approximately 0.30 inches thick, with 49 holes centered on a 1 inch pattern.

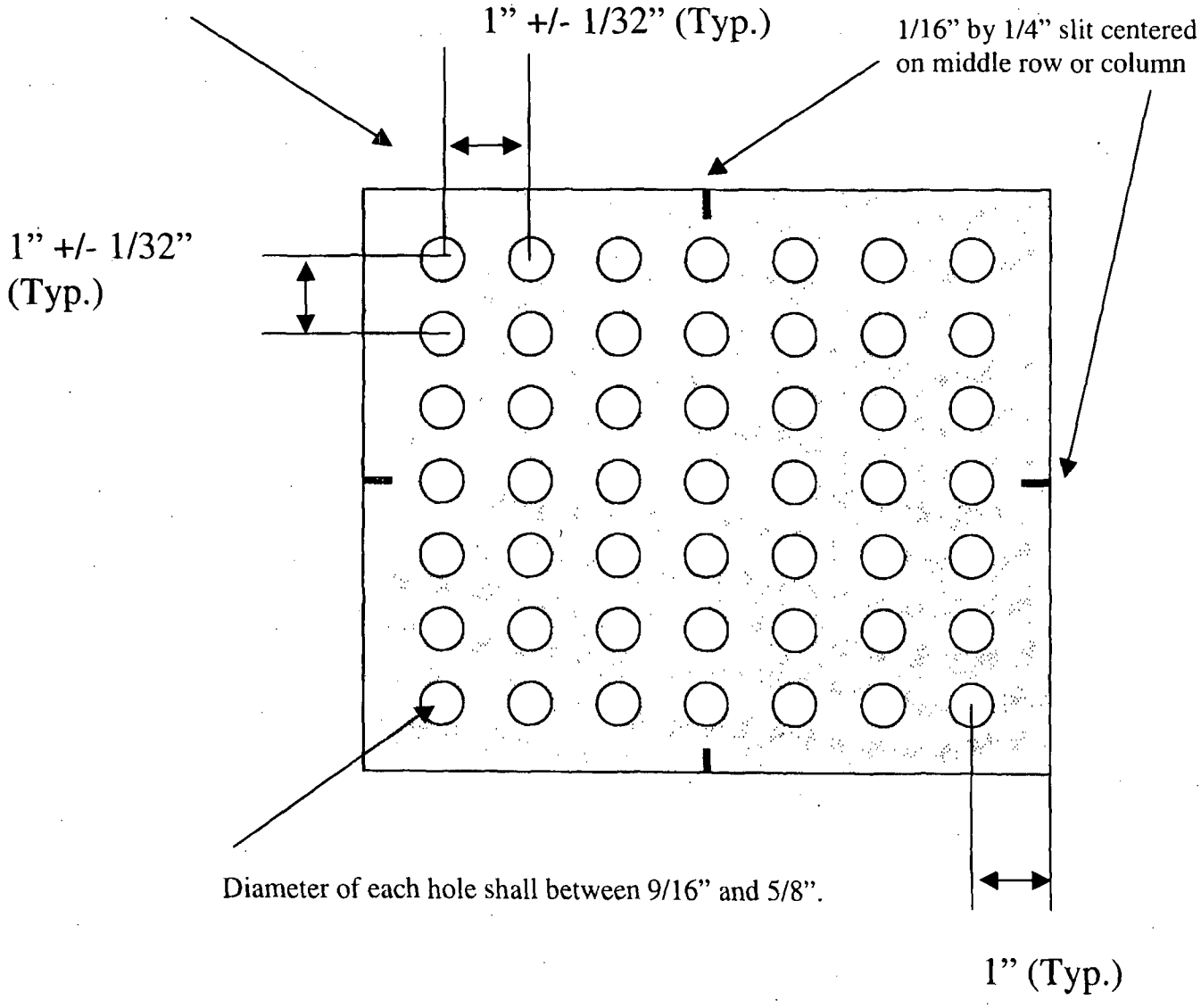


Exhibit 3

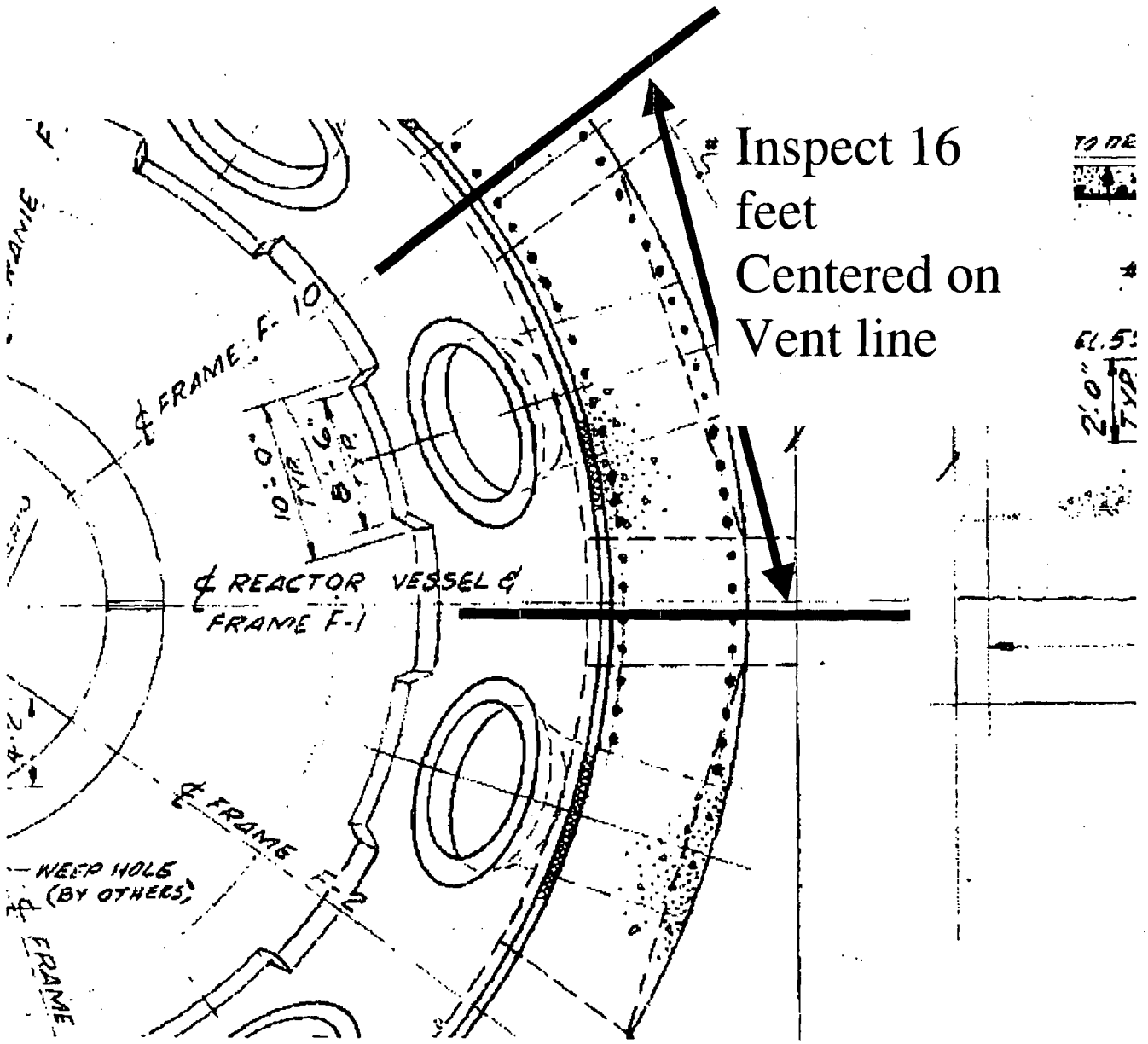

Inspect 16
feet
Centered on
Vent line
℄ FRAME F-10
℄ REACTOR VESSEL ℄
FRAME F-1
℄ FRAME
WEEP HOLE
(BY OTHERS)
℄ FRAME

Exhibit 4

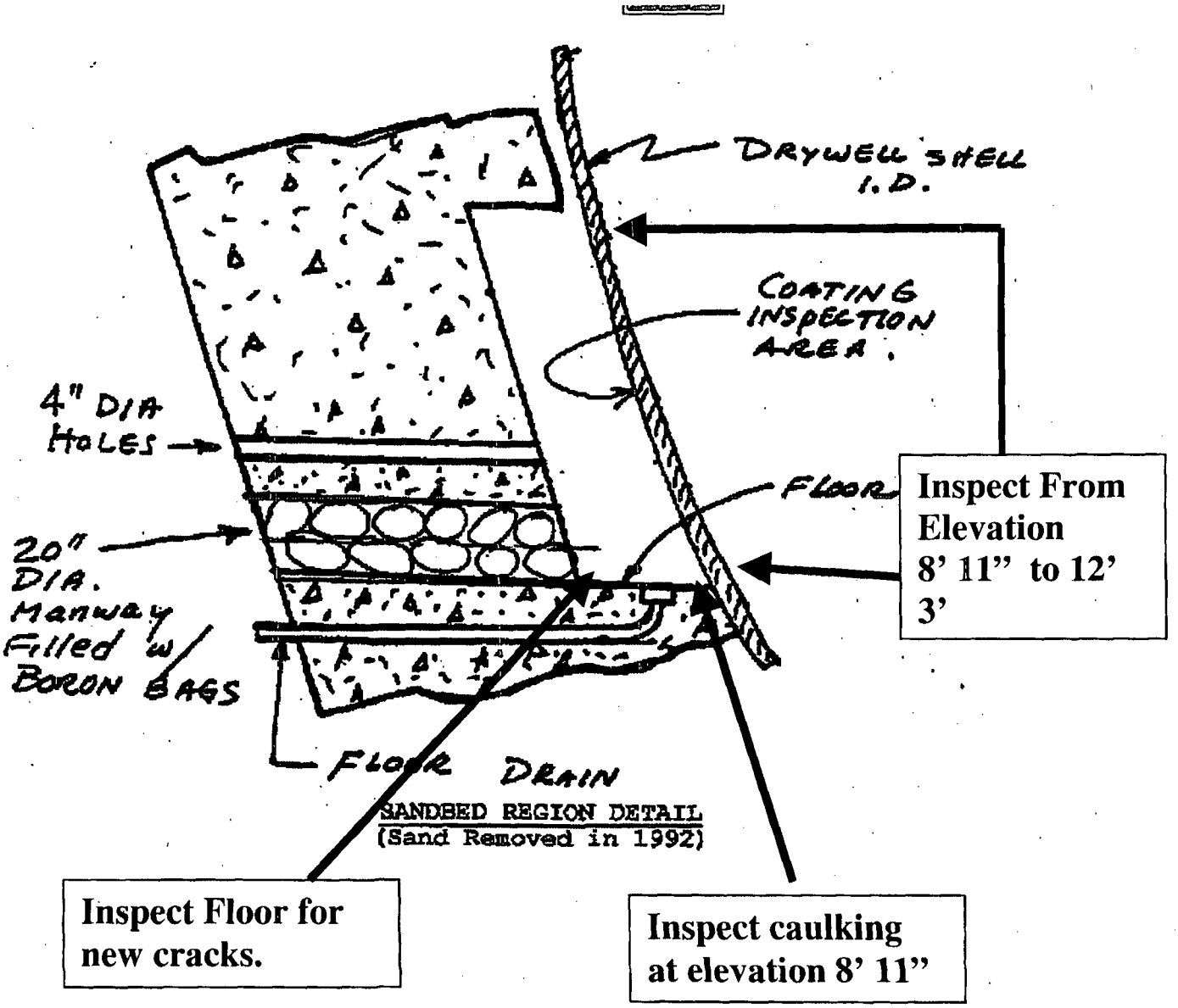
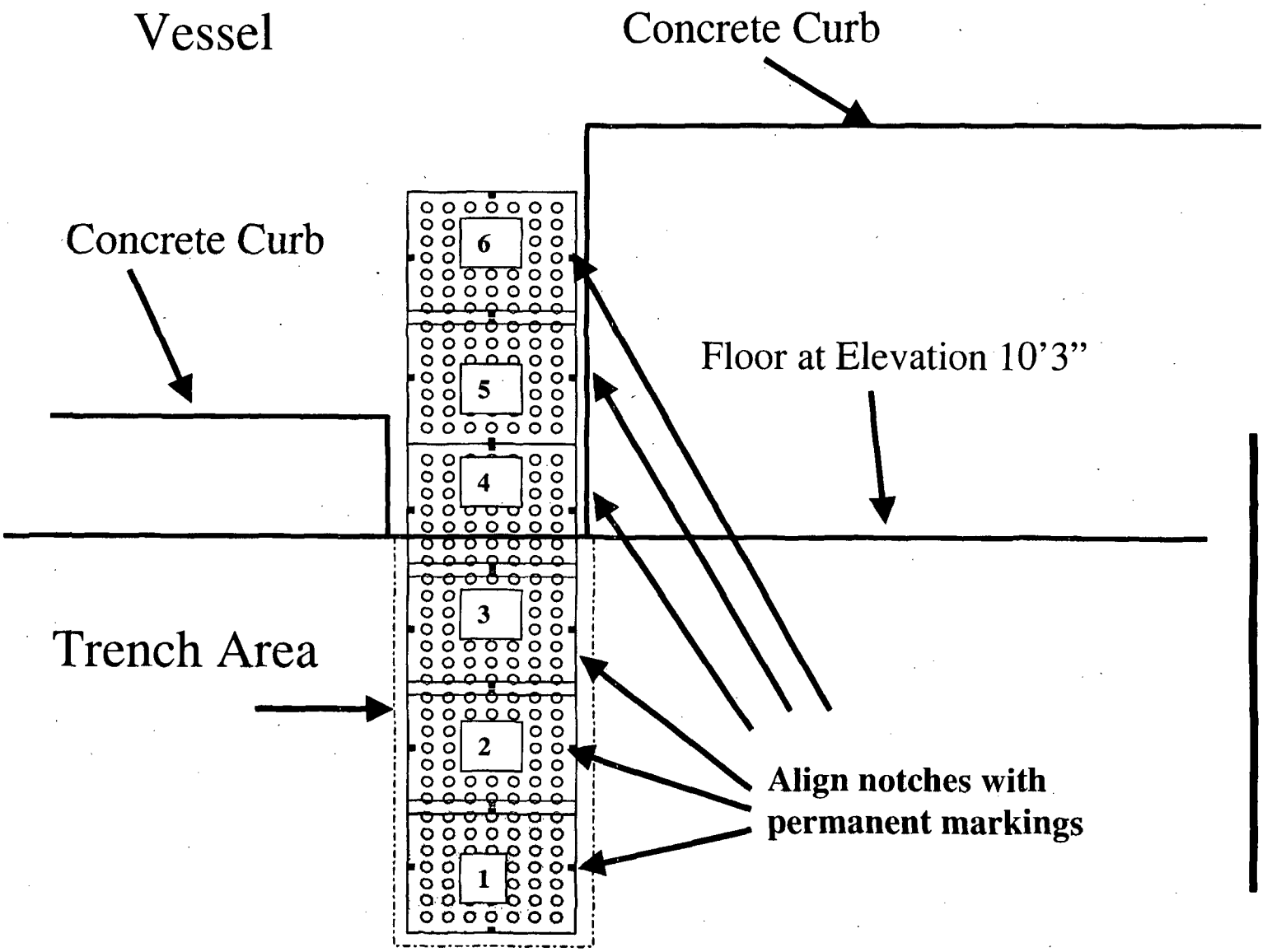
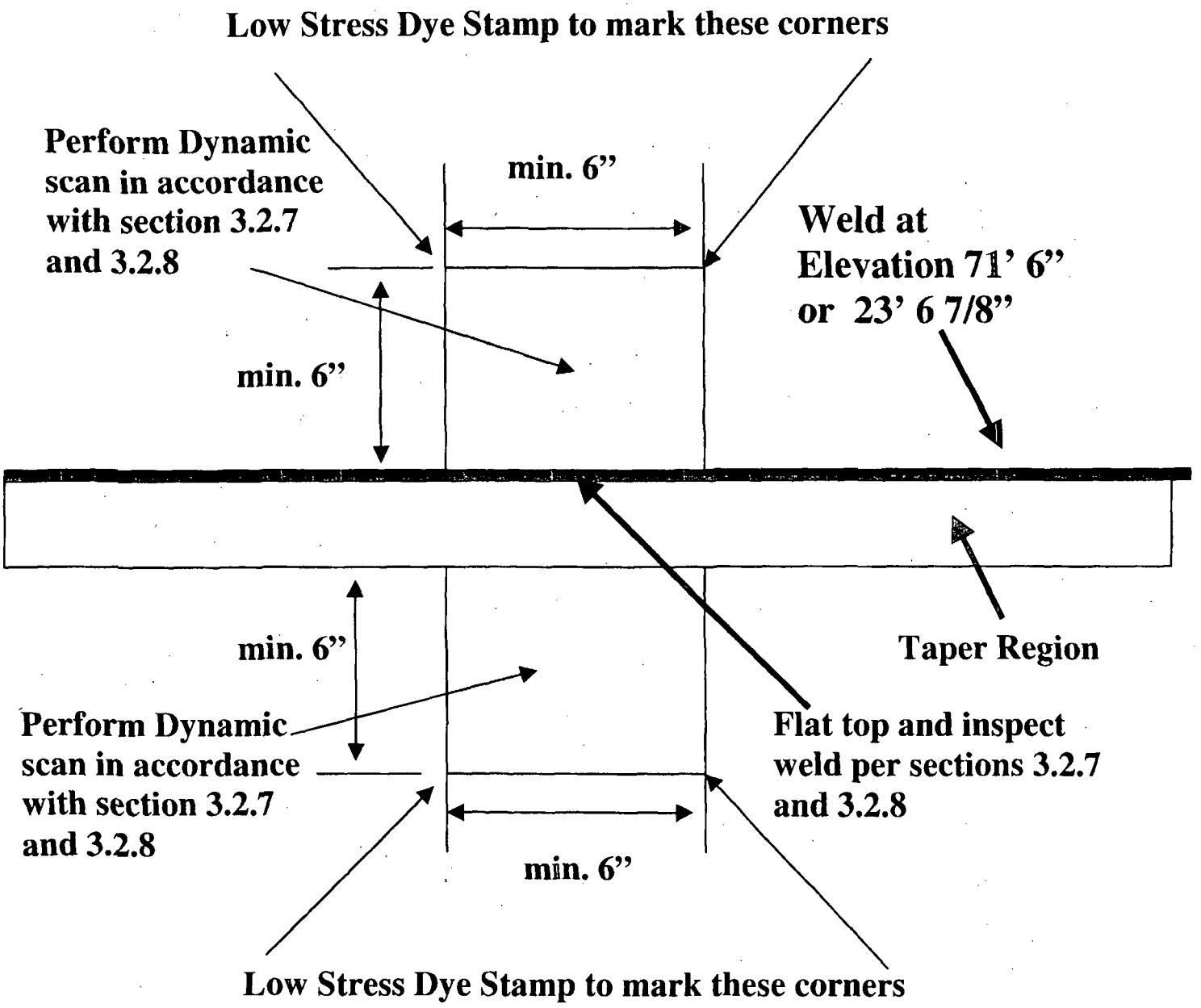

DRYWELL SHELL I.D.
COATING INSPECTION AREA.
4" DIA HOLES
20" DIA. Manway Filled w/ BORON BAGS
FLOOR
FLOOR DRAIN
SANDBED REGION DETAIL
(Sand Removed in 1992)
Inspect From Elevation 8' 11" to 12' 3'
Inspect Floor for new cracks.
Inspect caulking at elevation 8' 11"

Exhibit 5



Elevation View of Trenches

Exhibit 6



Elevation View