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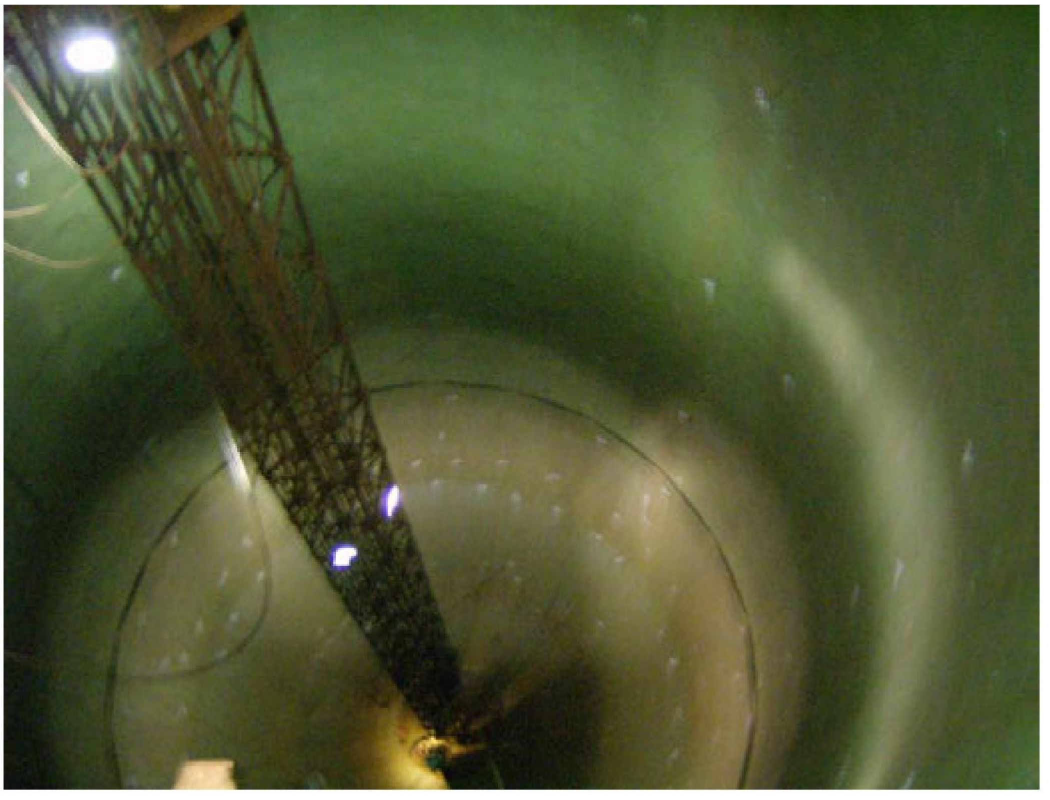
MODIFIED API-653 OUT-OF-SERVICE
TANK 20
RED HILL



From:

ENGINEERING & INSPECTIONS HAWAII, INC.

P.O. Box 700217
Kapolei, HI. 96709-0217

"Providing Excellence in NDE and Quality Inspection Services to Industries Worldwide"

Quality • Integrity • Reliability

ENGINEERING & INSPECTIONS HAWAII, INC.

December 5, 2008

Mr. Bruce Huddleston M.S.
Shaw Environmental, Inc.
590-B Paiea St.
Honolulu, HI 96819

Subject: Tank No. 20 Red Hill Fuel Facility

SYNOPSIS

During September and October 2008, **Engineering & Inspections Hawaii, Inc.** performed a modified Out-of Service inspection on Tank **2** at the Red Hill fuel storage facility. This inspection was performed in accordance with the Clients requirements and the latest edition of API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction by a certified API 653 inspector. All personnel performing nondestructive examinations are certified to at least SNT-TC-1A level II.
Red Hill tanks are a design engineered underground storage tank and therefore do not fall under the requirements of API-653. The API-653 document was utilized as a guide for the evaluation of findings and recommendation of repairs, where necessary, during this inspection.

Tank Data

Tank No. 20
Year Built: 1943 - 1945
Design: Engineered Underground Storage Tank
Constructed: Morrison Knudsen
Product: JP-8
Capacity: 302,000 Bbls.
Size 100’ Dia. x 250’ High

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Background

Tank 20 is located at the Red Hill fuel storage facility located underground in a ridgeline between Halawa Valley and Moanalua Valley.
Tank 20 was built in 1943 (completed in 1945). Its nominal capacity is 302,000 barrels. The tank, like the others in Red Hill, is a concrete tank with a steel liner. The configuration is a vertical cylinder measuring 100 feet in diameter and 250 feet in height. The tank is domed on the lower and upper ends. The primary access point to the tank is from the upper tunnel which is at the 200 foot level of the tank. The tank has a center tower extending from the top to the bottom that is connected to the access point by a catwalk.

Surrounding Area:

Red Hill Facility is located completely underground

Foundation:

Engineered high pressure grouting with steel liner underground storage tank.

Access Structure

The tank internal is accessed by an upper manway with a catwalk to a central structural tower which extends from the tank bottom to the tank top. This access structure contains two boom lifts and an air operated central lift for inspecting the internal of the tank. The structure was inspected by Hawaii Engineering Group, Inc., Certified structural engineers. Recommendations, based on their findings, to repair or replace hardware was performed by contractor Dunkin and Bush as safety precautions prior to the inspection of this tank. No documented inspection of the recommended repairs has been performed.

Tank Internal

100% of the tank internal was inspected by the L.F.E.T (Low Frequency Electromagnetic Technique) by contractor TesTex Inc. Anomalies in the liner plate were identified by TesTex, Inc. and further evaluated as necessary. All areas below the nominal .250" for the liner plate were identified and mapped on TesTex reports, contained in the appendices of this report. Areas that were identified at or below .170" were evaluated and will be required to be repaired. Enterprise Engineering Inc. was contracted for calculating a T-min thickness threshold of which repairs would be required.

Approximately 600 1½" tank piping penetrations were noted throughout the tank. The piping was removed by mechanically cutting at the interior re-pad interface. Based on information provided to **Engineering & Inspections Hawaii, Inc.,** this condition will be addressed for repair recommendations by Engineering consultant; Enterprise Engineering, Inc.

Hammer testing of the lower dome revealed numerous voids behind the liner plate in the lower dome area. Of the 44 lower dome plates, approximately 22 were hammer tested with all 22 showing some degree of voids behind the plate. The smallest areas were noted to be six to eight square inches, the larger areas, specifically plates 23 and 24 have areas large enough that when hit with the hammer a visible deflecting of the plate was noticed.

Numerous lap welded patches were noted throughout the entire tank. Due to this being the first known out-of-service inspection of tank number 20, no known history exists as to the reason for these patches. The patches vary in size and shape with numerous patches noted not to meet the requirements of API-653. Patches were noted with non-radius corners and smaller than the minimum required six inch circular dimension.

Coating

The tank has numerous areas of coating failure. Numerous areas of positive corrosion blooms were also noticed during this inspection. Some of the corrosion blooms were 1½" in diameter with visible pitting beneath the corrosion. The entire lower dome is affected by active corrosion holidays or coating holidays making proper inspection difficult. The area referenced as the tank lower dome has approximately 40% coating failure with exposure of the tank steel liner. The area known as the tank Barrel section was noted to have smaller areas of coating failure. The tank upper dome was noted to have the best areas of coating with only minimal failure.

Hydrostatic Testing of Piping

Contractors Dunkin & Bush and Shaw Environmental Inc. performed the hydrostatic testing of the tank piping as defined in the work plan. Engineering and Inspection, Inc. did not witness these test but did review the final test data. Based on the information supplied, the following lines were tested with the results listed below; Copies of the data reports are included in the appendices of this report.

16" Pipeline	Acceptable
32" Pipeline	Acceptable
6" Slop line	Failed
6" Steam Line	Failed
8" Steam Line	Acceptable

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Settlement Survey

This is an underground storage tank; settlement surveys could not be performed.

Recommendations

Mandatory Repairs:

Repairs that affect the overall operability and integrity of the tank; and must be performed in the immediate near future.

1. Perform visual and magnetic particle inspection of the internal structural tower and catwalk where additional structural members or repairs have been made by welding; as outlined in the Hawaii Engineering Group, Inc. report
2. Evaluate the internal coating system by a certified NACE Inspector.
3. Perform engineering evaluation of large voids noted behind the liner plate in the lower dome.

Based on the inspection findings provided by TesTex, Inc. and as referenced by the TesTex, Inc. Flaw Log for Tank No. 20. And further defined by remaining T-min thickness calculations as provided by Enterprise Engineering, Inc.

Flaw #47A-C	Lack of Fusion in weld; Lower Dome; Repair by Welding
Flaw #50	Lack of Fusion in weld; Lower Dome; Repair by Welding
Flaw #51	Lack of Fusion in weld; Lower Dome; Repair by Welding
Flaw #146	Lack of Fusion in weld; Barrel; Repair by Welding
Flaw #166	Mechanical Gouge; Barrel; Repair by Welding
Flaw #173	Mechanical Gouge; Barrel; Repair by Welding
Flaw #174A/B	Lack of Fusion in weld; Barrel; Repair by welding
Flaw #212	Lack of Fusion in weld; Expansion Joint; Repair by welding
Flaw #215	Mechanical Gouge; Expansion Joint; Repair by Welding
Flaw #219	Lack of Fusion in weld; Barrel; Repair by welding
Flaw #221	Mechanical Gouge; Expansion Joint; Repair by Welding
Flaw #227	Mechanical Gouge; Expansion Joint; Repair by Welding
Flaw #258	Lack of Fusion in weld; Expansion Joint; Repair by welding

Flaw #266A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #267	Pitting in weld; Expansion Joint; Repair by welding
Flaw #276	Mechanical Gouge; Expansion Joint; Repair by Welding
Flaw #277	Lack of Fusion in weld; Expansion Joint; Repair by welding
Flaw #278	Lack of Fusion in weld; Expansion Joint; Repair by welding
Flaw #302A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #303	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #304	Loss of Wall @ .165"; Upper Dome; Repair by use of lap patch plate .250" thick, 16" x 16" with radius corners
Flaw #305	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #312	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #313A/C	Pitting in Weld; Upper Dome; Repair by welding
Flaw #313B/D	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #314A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #325	Loss of Wall @ .137"; Upper Dome; Repair by use of Tombstone shaped lap patch plate .250" thick, 10" x 10" with radius top to cover Flaws 325 and 326
Flaw #329	Base Metal Arc Gouge; Expansion Joint; Repair by welding
Flaw #330	Base Metal Arc Gouge; Expansion Joint; Repair by welding
Flaw #334	Loss of Wall @ .137"; Expansion Joint; Repair by use of lap patch plate .250" thick, 16" x 16" with radius corners
Flaw #337	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #341A/C	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #345	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #346A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #347	Through Hole on Strap; Upper Dome; Repair by welding
Flaw #351	Base Metal Arc Gouge; Upper Dome; Repair by welding

Flaw #352	Base Metal Arc Gouge; Upper Dome; Repair by welding
Flaw #353	Base Metal Arc Gouge; Upper Dome; Repair by welding
Flaw #358/477	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #359A-E	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #360	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #362	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #363	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #364	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #365	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #366	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #367	Mechanical Gouge; Upper Dome; Repair by Welding
Flaw #369	Weld Pit .125"; Upper Dome; Repair by welding
Flaw #375	Lack of Fusion in Weld; Upper Dome; Repair by Welding
Flaw #377	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #378	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #379A-C	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #380	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #381	Weld Pit .063"; Upper Dome; Repair by welding
Flaw #382A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #383A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #384	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #385	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #389	Mechanical Gouge; Upper Dome; Repair by Welding
Flaw #392	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #393	Lack of Fusion in weld; Upper Dome; Repair by welding

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Flaw #394A-F	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #395	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #397	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #401	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #406	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #407	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #408A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #409	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #413A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #414A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #415	Mechanical Gouge; Barrel; Repair by Welding
Flaw #416	Weld Pit .125"; Upper Dome; Repair by welding
Flaw #417A/C-E	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #417B/F	Weld Gouge; Upper Dome; Repair by Welding
Flaw #421	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #423	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #426	Mechanical Gouge; Upper Dome; Repair by welding
Flaw #432	Lack of Fusion in tack weld; Upper Dome; Repair by welding
Flaw #433	Lack of Fusion in tack weld; Upper Dome; Repair by welding
Flaw #434	Lack of Fusion in tack weld; Upper Dome; Repair by welding
Flaw #435	Lack of Fusion in tack weld; Upper Dome; Repair by welding
Flaw #436	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #437A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #439	Lack of Fusion in weld; Upper Dome; Repair by welding

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Flaw #441	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #442	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #447A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #449	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #451	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #452	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #453A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #455A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #463A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #467A/B	Lack of Fusion in weld; Barrel; Repair by welding
Flaw #468	Lack of Fusion in weld; Under Catwalk; Repair by welding
Flaw #469A/B	Lack of Fusion in weld; Manway; Repair by welding
Flaw #470	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #471	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #472	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #473A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #474A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #475	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #476	Lack of Fusion in weld; Extension; Repair by welding
Flaw #477/358	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #478	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #479	Weld Gouge .085"; Upper Dome; Repair by welding
Flaw #480A/B	Lack of Fusion in weld; Upper Dome; Repair by welding
Flaw #481A-C	Lack of Fusion in weld; Upper Dome; Repair by welding

Flaw #482 Crack in weld; Lower Dome; Repair by Welding

Note: All of the above repairs will require welding by a certified welder to approved welding procedures. All repairs to existing welds requiring weld excavation are required to be inspected by magnetic particle or liquid Penetrant after excavation to ensure defect removal. Final welds are required to be inspected by visual, magnetic particle or liquid penetrant methods. Addition of lap welded patch plates where required will also require inspection by the vacuum box inspection method.

Recommended Near Future Repairs:

Repairs that do not adversely affect the operability or integrity of the tank for continued service.

Continued service will be determined by Enterprise Engineering, Inc upon review of all data and T-min calculations.

If you have any questions regarding this matter or require any additional information, please do not hesitate to contact Ken McNamara at (808) 682-1667 or by fax at (808) 682-1834.

Respectively submitted,

Ken McNamara
Certified API-653 Inspector No. 873

Reviewed By:____________________
Brian McKenna; Project Manager

Attachments____________________

A. Photographs
B. Report; Hawaii Engineering Group, Inc.
C. Enterprise Engineering, Inc. T-min Calculations
D. Report; TesTex, Inc. Data mapping
E. Excel spread sheet of data findings and repair recommendations
F. Pressure test data sheets

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Attachment A

Photographs

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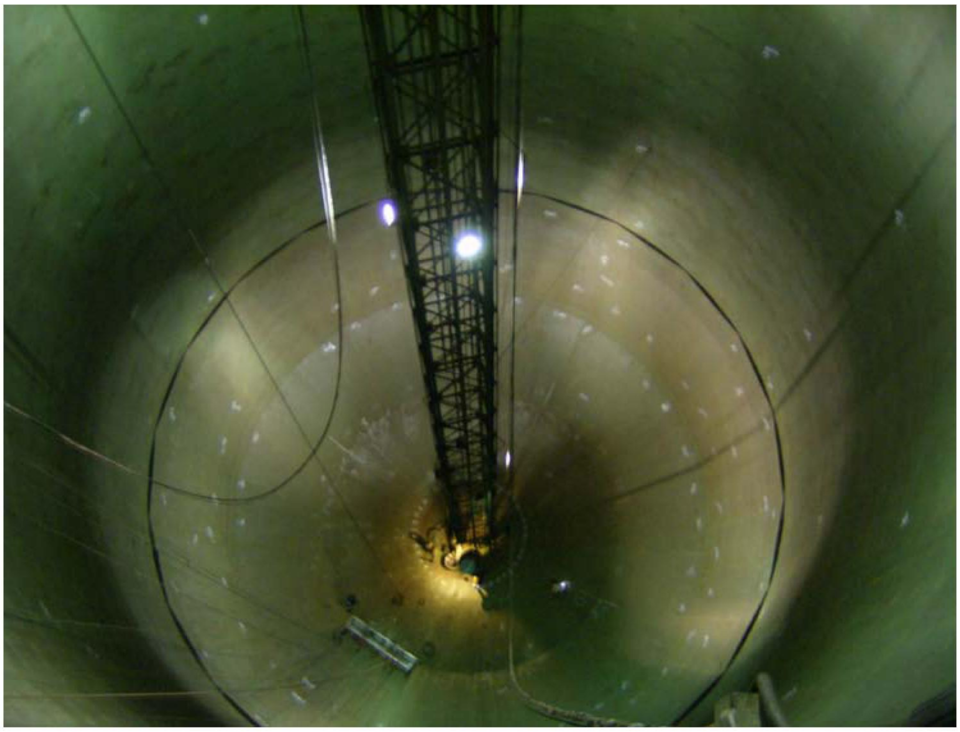

Looking down at the lower dome from the catwalk

Transition from tank floor to the lower dome section

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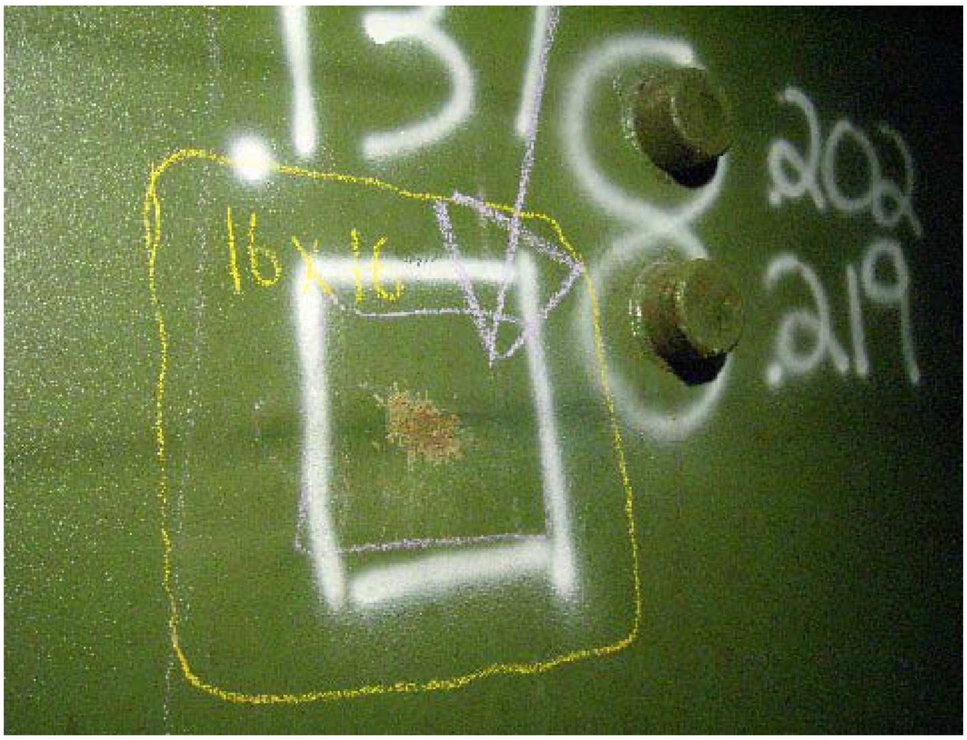
One of approximately *Six Hundred* piping penetrations that were removed requiring repair



Location of Flaw 334 Underside corrosion at .137" requiring a 16" X 16" Lap Welded Patch

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Flaw 304 Loss of Wall measured .165"

Location of piping penetration removal; **Note:** Condition of Coating

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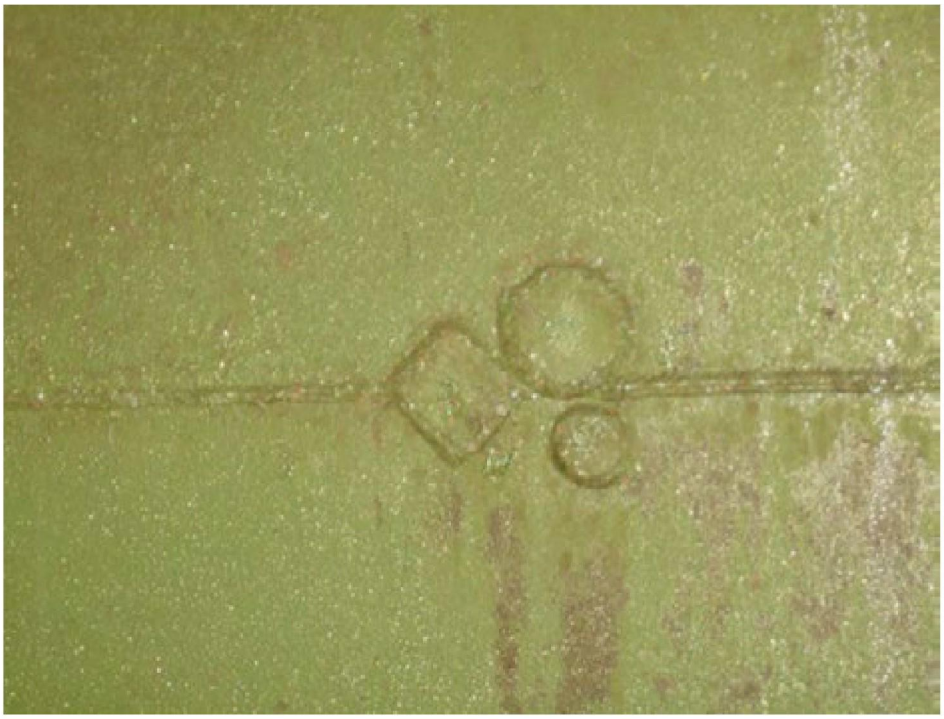

Existing Lap Patches in the Barrel section of tank 20 **Note:** Coating condition

Flaw 347 through hole in strap

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Attachment B

Report: Hawaii Engineering Group, Inc.

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HAWAII
ENGINEERING
GROUP, INC.

Consulting Civil Engineers, Structural Engineers & Land Surveyors
US (SBA), 8(a) & SDB Certified

October 07, 2008

Mr. Steve Skeel, Project Manager
Dunkin & Bush, Inc.
4648 Pacific Highway, Bellingham
Washington 98226

Project: Red Hill Tanks
Subject: Verification of Tower inside Tank # 20

Dear Mr. Skeel

A site visit was made on June, 05, 2008 to inspect and report on the condition of the tower frame, boom, cables, work platforms and spider hoist assembly and support framing inside Tank # 20:

1. Tower Frame and Boom

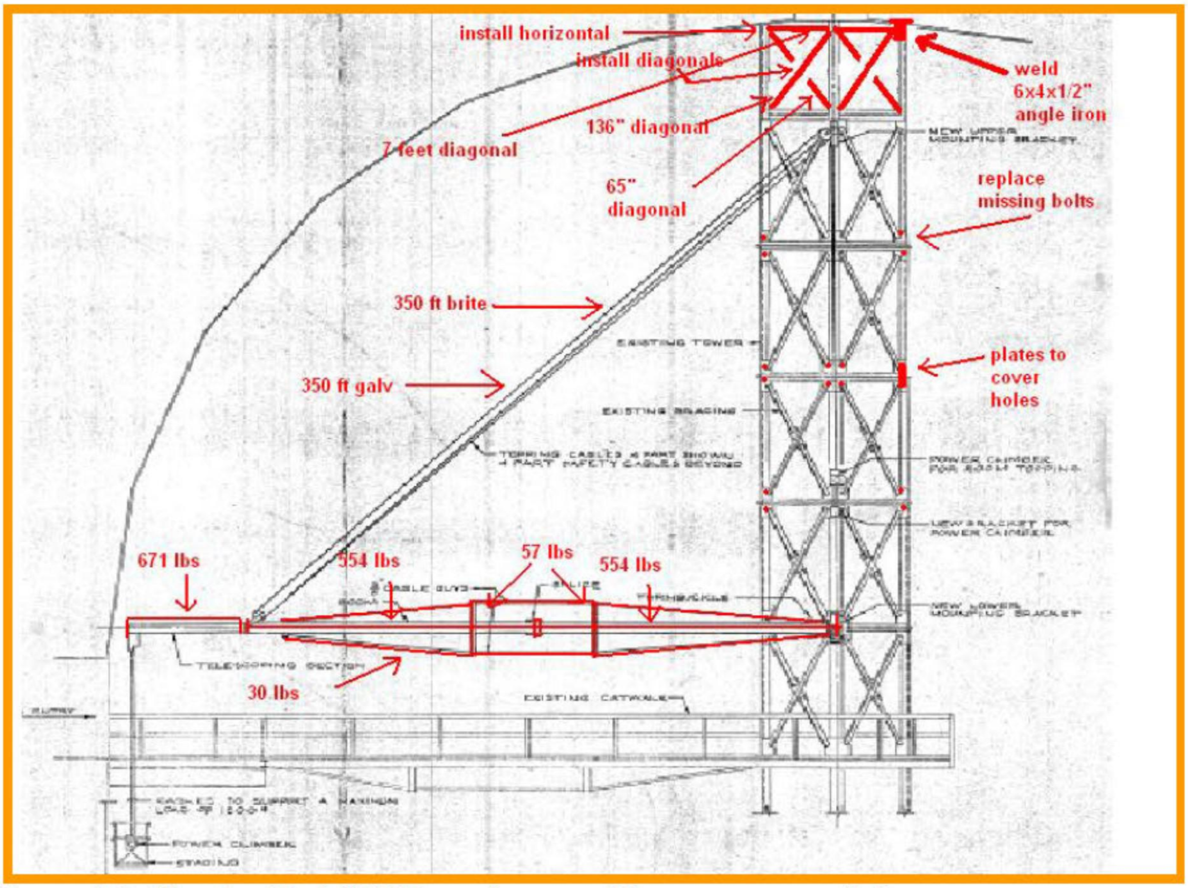
Upon inspection of the tower frame and boom, some horizontal and diagonal members were found to be missing, some bolts were found to be missing and some holes were found that needed to be covered by plates (see image #1 & #2)). The recommendations for the frame are summarized in the image #3 below:

Image 1: *Showing Tank #20 Tower frame and boom missing members and bolts*

1088 Bishop St., Suite 2506 Honolulu Hawaii 96813 – Tel: (808) 533-209 Fax: (808) 533-2059
Email: heg@hawaiiengineering.net

Tower legs were not supported by the tank at the top. These legs were welded to the tank for support and the missing braces were installed.

Image# 2: *Showing Tank #20 Tower leg not welded to the tank.*



Image# 3: *Showing Tank #20 Tower frame and boom recommendations*

All above proposed changes were accomplished safely.

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Email: heg@hawaiiengineering.net

2. Spider Hoist Assembly:

The assembly consists of three cables anchored on the top by a 42" long 8x8 I-Beam resting on a 1/4" thick top flange plate of the dome(See Image #3).

Image #3: *Showing Tank #20 Spider hoist assembly top anchoring*

A 5/16" spider hoist cable is attached to the top anchor I-Beam with a 3/8" choke cable and 5/8" diameter shackle (attached to a 7/8 shackle). The life line cables are also 5/16" thick and attached to the top anchor I-Beam with a 5/16" choke cable and 5/8" shackles. (See Image #4)

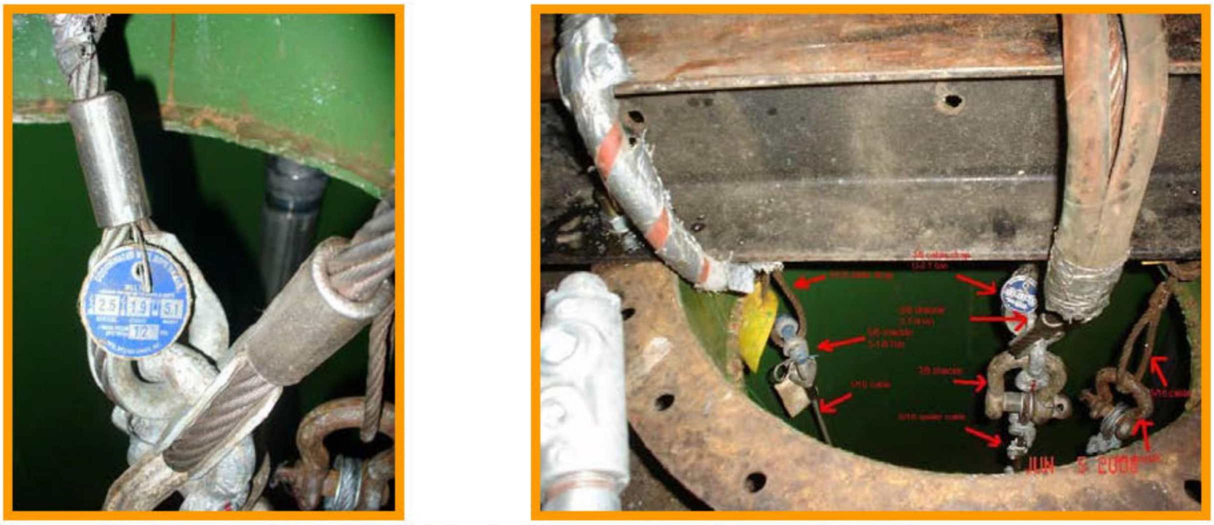


Image #4: *Showing Tank #20 Spider hoist assembly cables and shackles*

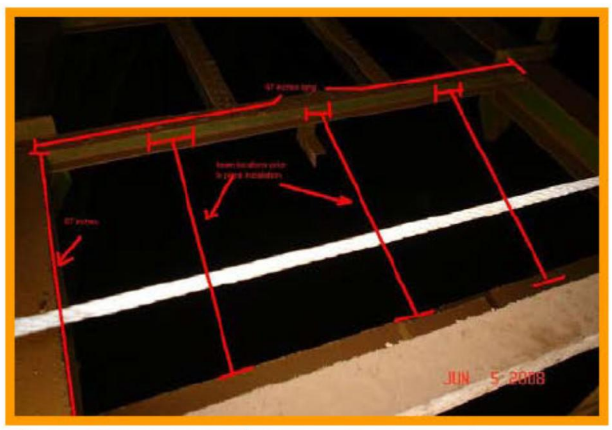
The Working Load Limit of a 5/16" choke cable is 2000 pounds. The smallest shackle in the assembly holding the spider is 5/8" shackle with a Working Load Limit of 3-1/4 ton, or 6,500 pounds. The cable bends and shackles reduce the Safe load another 50%. Therefore, a safe working load on the cables is 1,000 pounds. **We consider the installed cable and shackle configuration to be structurally safe for spider loads of upto1000 pounds.**

The beam supporting the spider hoist assembly was supported by the flange around the opening. This condition could produce buckling in the flange. Our recommendation was to cut off the excess length of the supporting beam and to provide blocking under the beam to avoid loading the flange. This was safely accomplished as seen in Image #5

Image# 5: *Showing Tank #20 Top Anchor I-Beam shortened and supported.*

3. Working Platform

To use the framing adjacent to the entrance of the tank as a work platform, our recommendation was to install four horizontal beams prior to installing floor sheathing. The proposed beams would match the existing beam sizes. The platform condition and the recommendations are shown in Image #6 below.



Image# 6: *Showing Tank #20 Work Platform and new beam installation recommendation .*

This report does not address portions of the structure other than those areas mentioned, nor does it provide any warranty either expressed or implied for any portion of the existing structure. If there are any comments or questions on any item above, please do not hesitate in calling.

Sincerely,

Hawaii Engineering Group, Inc.

Ather R. Dar, P.E.
President

Consulting Civil Engineers, Structural Engineers & Land Surveyors
1088 Bishop St., Suite 2506 Honolulu Hawaii 96813 – Tel: (808) 533-209 Fax: (808) 533-2059
Email: heg@hawaiiengineering.net

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Attachment C

T-min Calculations
Provided by; Enterprise Engineering Inc.

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Ken McNamara

From: Chun, Wilfred [wilfred.chun@shawgrp.com]
Sent: Tuesday, April 22, 2008 5:09 PM
To: Pang, Incheol (NFESC)
Cc: Dygart, Aaron; Phillips, David; Weese, Todd; kenm.eihawaii@hawaiiantel.net; Barry.eihawaii@hawaiiantel.net; l.mcdougal@testex-ndt.com; Steve Brooks; Steve DiGregorio
Subject: FW: Red Hill Tank 2 and 20 Tmin Calculation

Incheol – Forwarded for your info and use.

Rgds,

Wilfred Chun, P.E.
Project Manager
Shaw Environmental & Infrastructure, Inc.
590 B Paiea St.
Honolulu, HI 96819-1835
808.840-2015 direct
808.388-6878 cell
808.839-0339 fax
wilfred.chun@shawgrp.com

From: Stephen J. DiGregorio [mailto:sjd@eeiteam.com]
Sent: Tuesday, April 22, 2008 2:06 PM
To: Chun, Wilfred
Cc: Weese, Todd; Dygart, Aaron; Phillips, David; Steve Brooks; Stacy Kaplan-McMillan
Subject: Red Hill Tank 2 and 20 Tmin Calculation

Wilfred,

My responses to Incheol's comments are provided below. Due to the uncertainty in calculating corrosion rates, applying a factor of safety to Tmin has merit. You will see in the calculations and recommendations that follow, I have recommended a revised Tmin = 0.170 inches. I will revise EEI's formal Steel Liner Plate Minimum Thickness Assessment to reflect the new Tmin calculations and recommendations.

EEI Response to Comments

1. It is not possible calculate an actual corrosion rate for the Red Hill Tanks because the time interval during which corrosion occurred is unknown and can not be determined. Depending on the time interval that is assumed, the corrosion rate can be higher or lower compared to the actual corrosion rate. Additionally, it is possible that conditions causing external corrosion can change over time. Available record drawings indicate the rock face of the barrel of the tanks is lined with gunite and coated with either asphalt paint or "red dirt" paint; and that the space between the gunite lining and the steel liner plates is filled with reinforced concrete. It is known that cracks or other conditions have developed in the gunite or reinforced concrete allowing water to migrate to the steel liner plates and corrode steel liner plates that previously had no indication of external corrosion. This has been going on probably for the entire life of the tank, so it is not new.

2. The rock stratum surrounding the Red Hill tanks varies in type and porosity, thus the water content and corrosivity of the rock can vary from one location to another. Because of these highly variable conditions, selecting areas of the steel liner and measuring the remaining thickness to determine actual corrosion rates would not necessarily be representative of external corrosion conditions throughout the tank. It is possible that more severe corrosion could exist at areas that are not measured.

3. EEI's calculation of the external corrosion rate (0.001744 inches per year) and Tmin =0.140 inches follows the procedure outlined in API 653 section 4.4.7.1, which assumes a linear (i.e. constant) corrosion rate based on the age of the tank. For Tanks 2 and 20, the external corrosion rate was calculated based on the age of

the tank in 20-years (i.e. 86 years old in 2028). EEI acknowledges that this calculated corrosion rate is not based on thickness data of the steel liner plates; however as stated above, selecting areas of the steel liner and measuring the remaining thickness to determine actual corrosion rates would not necessarily be representative of external corrosion conditions throughout the tank. On the other hand, there may not be any location on the tank that would have a more aggressive corrosion rate than that determined by our method of calculation, unless there has been a drastic change in conditions. Should areas be present that have a higher corrosion rate than our calculated corrosion rate, the remaining thickness will have a Tmin less than 0.140 inches and would be repaired.

4. EEI has not established a 20-year interval until the next inspection. A 20-year interval was used to calculate Tmin. A shorter interval until the next inspection could be used.

Summary and Conclusions

1. It is not possible calculate an actual corrosion rate for the Red Hill Tanks because the time interval during which corrosion occurred is unknown and can not be determined.
2. Selecting areas of the steel liner and measuring the remaining thickness to determine actual corrosion rates would not necessarily be representative of external corrosion conditions throughout the tank because the rock stratum surrounding the Red Hill tanks varies in type and porosity.
3. EEI's calculated Tmin = 0.140 inches is based on the age of the tank in 20-years (i.e. 86 years old in 2028). As stated in EEI's Steel Liner Plate Thickness Assessment, a Tmin = 0.140 inches has no safety factor. If a more conservative approach is desired, a shorter interval until the next inspection (i.e. 10 years) or Tmin based on higher external corrosion rate or both could be used. Given the uncertainty in calculating a corrosion rate, using factor of safety for Tmin has merit.

Recommendations

1. As it is not possible to establish actual corrosion rates, a factory of safety applied to the previously recommended Tmin = 0.140 inches may have merit. Considering the guidance of API 570, which uses twice the corrosion rate in any remaining life, or pressure capability calculations, the new Tmin, at twice the corrosion rate, would be 0.170 inches. This new Tmin takes into consideration the uncertainty of calculating a corrosion rate and the potential for internal corrosion given the reported condition of the interior coating.
2. EEI, therefore recommends Tmin = 0.170" be used as the criteria for determining whether thin and pitted areas in the 1/4-inch thick steel liner plates in the, barrel, and lower dome require repair.
3. Tmin = 0.170 inches does not apply to the 1/2-inch thick floor (base plate) of the lower dome.
4. As the steel liner plates are not structural elements and should not be relied upon as a structural element to resist hoop and tensile stresses in the barrel and lower dome or compressive stress in the upper dome, consult EEI when voids are found behind liner plates.

Revised Tmin Calculations

Following the guidance of API 570 which uses twice the corrosion rate in any remaining life, or pressure capability calculations, a revised corrosion rate and Tmin is calculated as follows:

Parameters

- Original Thickness of Liner Plates: 0.250"
- Remaining Thickness at the Next Inspection: 0.10" based on the tank having no means to contain a leak
- Interval until the Next Inspection: 20 years maximum
- Year Tank Constructed: 1942

Revised Corrosion Rate and Minimum Thickness

For a 20-year service interval starting in 2008, the next inspection would be in 2028. Using the API 653 straight-line method of calculating corrosion rates and a 0.10" remaining thickness at the next inspection in 2028, the external corrosion rate is as follows:

Maximum permissible metal loss = 0.250" – 0.10" = 0.150"

Age of tank in 2028 = 2028 - 1942 = 86 years

Considering the 0.150" of metal loss occurs over the life of the tank, the external corrosion rate is:

External corrosion rate = 0.150" / 86 years = 0.001744 in / year

Following the guidance of API 570, using 2 times the corrosion rate results in a Tmin = 0.170 inches as follows:

Two times corrosion rate = (2) (0.001744 in / yr) = 0.003488 in /yr

A two times the corrosion rate, the metal loss that is expected to occur during the next 20 years is:

Metal loss during next 20 years = (0.003488 in / year) (20 years) = 0.0.70"

The minimum thickness required in 2008 to have 0.1" remaining thickness in 2028 at twice the corrosion rate of 0.001744 in / yr is:

Tmin = 0.070" + 0.100" = 0.170"

Steve

Stephen J. DiGregorio, P.E.
Chief Civil / Structural Engineer
Enterprise Engineering, Inc.
5 Depot Street
Freeport, ME 04032
TEL: (207) 869-8006

Original Message-----
From: Chun, Wilfred [mailto:wilfred.chun@shawgrp.com]
Sent: Thursday, April 17, 2008 1:08 PM
To: Steve DiGregorio ; Steve Brooks
Cc: Weese, Todd; Dygart, Aaron; Phillips, David
Subject: FW: Red Hill Tank 2 and Tmin Calculations

Steve - Request comment on Incheol's Tmin of 0.14 based on coating inspection below and serviceable for next 20 years.

Thks,

Wilfred Chun, P.E.
Project Manager
Shaw Environmental & Infrastructure, Inc.
590 B Paiea St.
Honolulu, HI 96819-1835
808.840-2015 direct
808.388-6878 cell
808.839-0339 fax
wilfred.chun@shawgrp.com
-----Original Message-----
From: [redacted]
Sent: Wednesday, April 16, 2008 4:15 PM
To: Chun, Wilfred; Dygart, Aaron; Weese, Todd; Phillips, David
Cc: [redacted]
Subject: RE: Red Hill Tank 2 and Tmin Calculations

Wilfred and Todd,

Thanks for forwarding the EEI's Tmin calculation for Tank 2 & 20. What does Shaw propose on this?

Here is my thoughts. Now EEI recommends 0.14" as minimum plate thickness based on two facts; 1/4" original plate & corrosion rate based on 0.1" minimum remaining thickness at the end of year 2028. I can understand how Stephen calculates Tmin for 20 year inspection cycle. However, here is my questions for this calculation and Tmin. The same question that I had on Tank 1405 (Tank 54) inspection interval. In normal API 653 inspection, a corrosion rate is established, and remaining life gets calculated to determine the next inspection date. On this calculation, Stephen established 20 year cycle, and calculate the corrosion rate. I guess it would be ok for 20 year long stand point. However, this would not give you a truly or close to real 'established corrosion rate'. Can this method be considered proper way to establish corrosion rate? This is exactly why I asked Shaw as part of Work Plan comments to justify 0.19" as Tmin for the inspection.

Also, Stephen assumed internal coating is serviceable for next 20 years as well to use 0.14" as Tmin. Recent coating inspection of Tank 2 by NAVFAC coating expert revealed that the existing coating was applied without any proper surface preparation in the 80's. And the current condition shows delaminating at substantial area of the interior. Under the consideration of tank age and condition, the coating expert recommended no coating repair. Repair attempt would do more harm than good. The bottom dome would be recoated after tank inspection, but no coating repair is considered on any part of the shell or upper dome area. If this information would make this calculation any different, please let Stephen know and recalculate Tmin based on current coating condition.

v/r,

[redacted]
805-331-2148

-----Original Message-----
From: Chun, Wilfred [mailto:wilfred.chun@shawgrp.com]
Sent: Wednesday, April 16, 2008 11:16
To: Pang, Incheol (NFESC); kenm.eihawaii@hawaiiantel.net
Cc: Barry.eihawaii@hawaiiantel.net; Dygart, Aaron; l.mcdougal@testex-ndt.com; Weese, Todd
Subject: FW: Red Hill Tank 2 and Tmin Calculations

Incheol - Attached is the Tmin by Enterprise.

Thks,

Wilfred Chun, P.E.

Project Manager

Shaw Environmental & Infrastructure, Inc.

590 B Paiea St.

Honolulu, HI 96819-1835

808.840-2015 direct

808.388-6878 cell

808.839-0339 fax

wilfred.chun@shawgrp.com

From: Stephen J. DiGregorio [mailto:sjd@eeiteam.com]
Sent: Wednesday, April 16, 2008 7:52 AM
To: Chun, Wilfred
Cc: Weese, Todd; Steve Brooks; Stacy Kaplan-McMillan
Subject: Red Hill Tank 2 and Tmin Calculations

Wilfred,

Enclosed are my calculations of Tmin for Red Hill Tanks 2 and 20. Let me know if you or the government have questions.

Steve

Stephen J. DiGregorio, P.E.

Chief Civil / Structural Engineer

Enterprise Engineering, Inc.

5 Depot Street

Freeport, ME 04032

TEL: (207) 869-8006

ENTERPRISE ENGINEERING, INC.

RED HILL TANKS 2 AND 20
FISC PEARL HARBOR, HAWAII

Steel Liner Plate Minimum Thickness Assessment
April 15, 2008

EEI Project No. 08-4895

GENERAL

Shaw is providing cleaning, inspection, and repair services for Tanks 2 and 20 at FISC Pearl Harbor Red Hill, Hawaii. Shaw has requested Enterprise Engineering, Inc. (EEI) calculate corrosion rates and the minimum thickness of the steel liner plates which will be used as the criteria for determining the need for repair based on a 20-year interval until the next inspection.

Record drawings of the Red Hill tanks indicate the steel liner plates in the upper dome, barrel, and lower dome in all of the tanks are 1/4" thick plate nominal. The floor (referred to as "base plate" on record drawings) of the lower dome in all of the tanks is indicated as 1/2" thick plate. This document prepared by EEI provides a calculation of corrosion rates and minimum required thickness of the 1/4" thick steel liner plates. This minimum thickness will serve as the criteria for determining the need to repair thin areas and pits for another 20-year interval until the next inspection.

RECOMMENDED REPAIR CRITERIA: STEEL LINER MINIMUM THICKNESS

It is reported that a Tmin of 0.19 inches was used on previous projects at Red Hill. EEI is not able to determine how this value was established. EEI recommends the following:

1. A minimum thickness (Tmin) of 0.140 inches be used as the criteria for determining whether thin and pitted areas in the 1/4-inch thick steel liner plates in the, barrel, and lower dome require repair. The upper dome area, with increased potential for atmospheric corrosion on the inside, can also use this Tmin criteria of 0.140 inches if it is determined the coating system is sound, there is no present internal corrosion, and the coating system has a remaining life of 20 years. Note: the Tmin value of 0.140 inches does not include any safety factor that the thickness of the steel liner plates will not be less than a minimum thickness of 0.10 inches at the end of another 20-year service interval. The justification for not using a safety factor is:

    a. API 653 does not use a safety factor.

    b. Tmin is based on a constant rate of corrosion (i.e. corrosion is assumed to not vary over time). Using a constant rate of corrosion is in accordance with API 653 and is considered conservative in that corrosion rates generally decrease over time unless conditions change.

c. A safety factor could be added to Tmin; however, this will involve more repairs and is not justified unless desired by the government or conditions are found indicating corrosion rates are higher than calculated.

2. Repair thin and pitted areas in the 1/4-inch thick steel liner plates in the upper dome, barrel, and lower dome having a minimum thickness (Tmin) less than 0.140 inches. Areas having Tmin equal to or greater than 0.140 inches do not require repair for a 20-year interval until the next inspection.

3. Tmin = 0.140 inches does not apply to the floor (base plate) of the lower dome.

4. EEI also calculated Tmin for a 10-year interval until the next inspection and determined Tmin in this case would be 0.120 inches. EEI can evaluate this alternative if desired.

5. Using Tmin = 0.140 inches as determined for 20-year interval until the next inspection and applying this criteria for a 10-year interval is an option as it is conservative and provides a factor of safety.

COMMENTS AND CLARIFICATIONS

EEI's calculation of Tmin is based on the following:

1. A 20-year interval until the next inspection in 2028 as indicated in Shaw's Work Plan.

2. An original plate thickness of 0.250 inches. Our calculation of Tmin does not take into account the original thickness of the plates may be thinner due to plate fabrication tolerances or other conditions. EEI recommends Shaw's inspector obtain ultrasonic thickness measurements of each plate (6 measurements minimum per plate). Submit for EEI review and assessment thickness measurements of plates having an average thickness less than 0.240". The 0.240 thickness is the ASTM A 6/A6M minimum thickness tolerance for 1/4-inch thick plates.

3. The rate of external corrosion was calculated using the API 653 straight line method and assuming metal loss occurring over the life of the tank (86 years) from tank construction in 1942 to the next inspection in 2028. The calculated rate of external corrosion does not take into consideration potential areas of concentrated corrosion caused by artifacts, welding rods, debris, rocks, microbial induced corrosion (MIC) in the form of small "worm-like" corrosion trails, or other conditions on the exterior of the liner plates the would cause concentrated corrosion. If these conditions are found, contact EEI for interpretation.

4. The rate of external corrosion and Tmin does not apply to the heat-affect zone of liner plates adjacent to welds (within 1 inch of the weld). As the corrosion rate in the heat-affected zone can be higher than areas outside the heat-affected zone, a higher Tmin value may be needed for the heat-affected zone. Information on plate thickness in the heat affected zone is needed to determine corrosion rates and Tmin of the heat affected zones of the steel liner plates. EEI

recommends Shaw's inspector obtain ultrasonic thickness measurements in the heat-affected zone in random areas in each quadrant of the upper dome, barrel, and lower dome for EEI assessment. Given the large quantity of welds in the liner plate joints, EEI recommends 20 UT thickness measurements be obtained in the heat-affected zones in each quadrant. Additional UT measurements may necessary if results are not consistent. Additionally, EEI recommends that we be notified when the remaining thickness in the heat-affected zone is less than 0.200 inches as additional assessment may be necessary.

5. The corrosion rate of product side corrosion is assumed to be 0.00 inches per year. This assumption is only valid if the existing interior coating is in serviceable condition and its service life is equal to or greater than the 20-year interval until the next inspection. If the interior coating is not expected to last another 20 years, product side corrosion may occur and thus the Tmin will need to be recalculated and increased. It should be noted that product side corrosion is not of concern when the tank is filled as areas are covered by product except at a water bottom in the lower dome. The 0.00 inches per year product side corrosion rate also does not take into consideration potential atmospheric corrosion of the steel liner plates if the coating is failing and not repaired and liner plates are exposed to atmosphere. Additional information is needed on the condition of the interior coating and whether atmospheric corrosion is present. This additional information may result in a greater Tmin of the upper dome, where atmospheric corrosion, and or degraded coatings is present.

6. A minimum thickness of 0.10 inches at the next inspection is used in the calculation of Tmin. A 0.10 inch minimum thickness is used as the steel liner plates are a hydraulic barrier and are not relied upon as a structural element to resist hoop and tensile stresses in the barrel and lower dome or compressive stress in the upper dome. The 0.10-inch criteria is similar to API 653 criteria for tank floors that have no means for containment of a leak.

7. As the steel liner plates are not structural elements and should not be relied upon as a structural element to resist hoop and tensile stresses in the barrel and lower dome or compressive stress in the upper dome, consult EEI when voids are found behind liner plates.

8. Our calculation of Tmin does not include any safety factor. A safety factor could be added to Tmin; however, this will involve more repairs and is not justified unless desired by the government or conditions are found indicating corrosion rates are higher than calculated.

9. Consult EEI when areas of thinning or pitting are found that exceed 12" in diameter.

CALCULATIONS

Parameters

- Original Thickness of Liner Plates: 0.250"
- Remaining Thickness at the Next Inspection: 0.10" based on the tank having no means to contain a leak
- Interval until the Next Inspection: 20 years maximum
- Year Tank Constructed: 1942
- Product Side Corrosion Rate: Assumed to be 0.00" per year based on the tank interior being coated and the life of the coating expected to exceed the interval until the next inspection

Corrosion Rate and Minimum Thickness

For a 20-year service interval starting in 2008, the next inspection would be in 2028. Using the API 653 straight-line method of calculating corrosion rates and a 0.10" remaining thickness at the next inspection in 2028, the external corrosion rate is as follows:

Maximum permissible metal loss = 0.250" – 0.10" = 0.150"
Age of tank in 2028 = 2028 - 1942 = 86 years

Considering the 0.150" of metal loss occurs over the life of the tank, the external corrosion rate is:

External corrosion rate = 0.150" / 86 years = 0.001744 in / year

Using this external corrosion rate, the expected metal loss that would have occurred thus far, (1942 to 2008) is:

Number of years from 1942 to 2008 = 66 years
Metal loss over 66 years = (0.001744 in / year) (66 years) = 0.115"

The minimum thickness required in 2008 to have 0.1" remaining thickness in 2028 at a corrosion rate of 0.001744 in / year is:

Tmin = 0.250" – 0.115" = 0.135"

Thus if Tmin = 0.135" in 2008; using an external corrosion rate of 0.001744" / year, the remaining thickness in 20 years (2028) is:

Metal loss occurring over the next 20 years = (0.001744" / yr) (20 years) = 0.035"
Remaining thickness at the end of the next 20 years = 0.135" – 0.035" = 0.10"
Use Tmin = 0.140" (0.135" rounded to 0.140")

Prepared by:

Stephen DiGregorio

Stephen J. DiGregorio, P.E.
Chief Structural Engineer
ANSI/API 653 Certified Aboveground Tank Inspector, Certificate No. 1113

ENGINEERING & INSPECTIONS HAWAII, INC.

Attachment D

Report: TesTex Data and Mapping

P. O. Box 700217 • Kapolei, HI 96709-0217 • Tel: (808) 682-1667 • Fax: (808) 682-1834 • E-Mail: E I Hawaii@aol.com

TesTex

STATE OF THE ART PRODUCTS & SERVICES
FOR NON-DESTRUCTIVE TESTING

LOW FREQUENCY ELECTROMAGNETIC TECHNIQUE

INSPECTION REPORT

OF

TANK #20

AT

RED HILL

IN

HONOLULU, HI

BY

TESTEX, INC.

DATE TESTED: SEPTEMBER 8, 2008 – OCTOBER 24, 2008

AUTHOR: LARRY MCDOUGAL

REVIEWED: PETE BERNARDING

PITTSBURGH (H.Q.)
Tel: (412) 798-8990
Fax: (412) 798-8995
www.testex-ndt.com
testex@adelphia.net

HOUSTON
Tel: (713) 680-8604
Fax: (713) 680-9469

CHI/SOUTH BEND
Tel: (574) 254-9953
Fax: (574) 254-9961

ATLANTA
Tel: (770) 323-8903
Fax: (770) 323-8603

PHILADELPHIA
Tel: (215) 638-4233
Fax: (215) 638-4237

NEW ORLEANS
Tel: (504) 393-0968
Fax: (504) 393-0762

JAPAN
Tel: 082-289-6770
Fax: 082-289-6769

INDIA
Tel: 91-22-55978015
Fax: 91-22-25510788

UNITED KINGDOM
Tel: 1469-541586
Fax: 1469-541587

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1.0 RESULTS AND CONCLUSIONS

Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

INTRODUCTION

An NDT inspection was conducted on Tank #20 at Red Hill in Honolulu, HI on September 8th – October 24th, 2008. This inspection focused on 100% testing of the Floor, Lower Dome, Barrel, Extension, and Upper Dome areas. The inspection was performed with the TesTex developed ***TS-2000 NDT Multi-channel System*** (for plate scanning using the principles of the ***Low Frequency Electromagnetic Technique***) and the ***Hawkeye 2000 System*** (for weld testing focusing on surface and subsurface cracking and pinholes). All defected areas found with the above-mentioned TesTex equipment were backed up and sized using regular ***Ultrasonic Technique, Ultrasonic Shear wave Technique*** and ***Magnetic Particle Technique***

The ***Ultrasonic Shear wave Technique*** was an additional service used which measured the depth of detected weld defects, provided they were oriented in a position that could be tested. The results of this inspection are detailed in the following report.

RESULTS

In beginning of this inspection (September 8, 2008), TesTex started scanning the floor plates (7 plates totaling 25 ft. in diameter) of tank #20. By end of the first day, surface area scanning was complete on the floor (491 sq ft), and started scanning on course 1 of the lower dome. Day 3 saw the completion of the surface area scanning of course 1 (2,695 sq ft) and the first 3-foot of course 2. Day 4 consisted of scanning of the welds using the Hawkeye on the floor (and around all pipe entry points), course 1, and the first 3 foot of course 2. The first week came to a close with the completion of the floor, course 1 and the beginning of course 2. It is to be mentioned that all scanning to this point could be reached from standing on either the floor or course 1 of the lower dome. In the beginning of the second week (September 15th, 2008), both teams had to set up the boomed baskets with the equipment for both types of scanning (LFET for liner plates and BFET for welds), since accessibility was no longer available from standing on the floor or course 1. Once the setup was complete, work continued on course 2 and was finished in the morning of day 2 (4,573 sq ft). The third day consisted of scanning course 3. This course (5,797 sq ft) was finished using both baskets by the morning of day 4. The rest of day 4 was spent scanning course 4. The third week (September 22nd, 2008) picked back up with course 4 of the lower dome, and saw its completion (5,634 sq ft) by the halfway point of the first day. The second half of the day marked the beginning of barrel scanning. The scans in this section of the tank consisted of 8 ft. wide (the width of the basket) drops from the extension/barrel interface down to the lower dome/barrel interface. Each team averages about 2 drops per day. By the end of the week, approximately 36% of the barrel was completed. The fourth week (September 29th, 2008) continued with Barrel scanning and by the end, the total finished barrel percentage rose to approximately 77%. The fifth week (October 6th, 2008) would begin with the completion of the barrel scanning (41,598 sq ft). By the second day scanning began in the extension area. This continued through the third day and into the afternoon of the fourth. Finishing out the last day of the week, scanning had started for team 2 on course A of the upper dome. Week six (October 13th, 2008) consisted of finishing up the extension (4,712 sq ft) for team 1, and the start of course A by the end of the first day. Team 2 continued on course A, and had moved into course B by the end of the second day. The third day marked the completion of course A (4,437 sq ft) by team 1 and team 2 moving into course C. Team 1finished Course B (4,082 sq ft) and team 2 started course D at the end of the third day. On the last day of the week, team 1 started and finished course C (3,458 sq ft) while team 2 finished course D. The last week of the inspection, week 7 (October 20th, 2008), marked the return of the fifth TesTex person and an ultrasonic technician. The ultrasonic technician began using Magnetic Particle technology on the lower dome/floor interface (this was done in place of Shear wave Technique because the intersection welds were covered with backer plates) and shear wave prove-up on any possible weld defects found in the tank. The first day also saw team 1 completing course D (2,632 sq ft) and team 2 finishing course E. On the second day, team 2 scanned the remaining portions of the lower dome, barrel, and extension under the catwalk. In addition, day two saw team 1 complete course E (1,664 sq ft). Day three was the last day that the two main teams worked in the tank. Team 1 scanned course F (491 sq ft) using ultrasonic trolleys while team 2 worked in the lower tunnel on U.T. spot checks inside of the 32-inch and 18-inch lines. These spot checks were done on the 32-inch line from the inside and consisted of a group of 8 circumferential readings taken every 1-foot across the approximate 40-foot span. The 18-inch line was too small to access internally, so readings could only be taken at 8 and 18 inches from the end. In addition, the inside of the manway was scanned using the LFET scanner. The following two days (October 23rd and 24th, 2008) were used to finish shear wave scans of the remaining possible weld defect locations. All of the gathered data was examined over the weekend, and a preliminary report was given on Sunday October 26th, which outlined all defects found in the tank. This report characterized type, size, location, etc. for each.

In addition to the above-mentioned scanning, all backer strips and associated welds in the upper dome were scanned using the Hawkeye BFET system.

CONCLUSIONS

As a result of this inspection, TesTex found 518 flaw indications most of which were either proved up with ultrasonic thickness measurements or sized using Ultrasonic Shear Wave Technique. All defects including their respective depth or other flaw characterization may be found in Section **4.0**, **PLATE TEST SUMMARY**.

Section **3.0** is **TANK MAPS,** which clarifies the numbering system and tank layout. Section **5.0** shows **typical waveforms** collected from these sections. Printouts of waveforms collected from this unit are included in **APPENDIX A** and are correlated to each plate where the original flaw indication(s) was observed.

2.0 UNIT DETAILS

Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

	Totals
Orientation	**Vertical**
Plate Thickness	
Upper Dome	**0.250”**
Lower Dome	**0.250”**
Barrel	**0.250”**
Floor	**0.500”**
Plate Material	**Carbon Steel**
Total Surface Area of Tank #20	**≈ 84,333 sq ft (plates)**
Upper Dome	**≈ 16,763 sq ft (plates)**
Extension	**≈ 4,712 sq ft (plates)**
Barrel	**≈ 43,668 sq ft (plates)**
Lower Dome	**≈ 19,190 sq ft (plates)**
Total Surface Area and Welds Scanned by TesTex	**≈ 84,333 sq ft (plates)**
	≈ 23,978 linear ft (welds)
Upper Dome	**≈ 16,277 sq ft (plates)**
	≈ 5,579 linear ft (welds)
course A	**≈ 4,437 sq ft (plates)**
	≈ 1,394 linear ft (welds)
course B	**≈ 4,082 sq ft (plates)**
	≈ 1,378 linear ft (welds)
course C	**≈ 3,458 sq ft (plates)**
	≈ 985 linear ft (welds)
course D	**≈ 2,632 sq ft (plates)**
	≈ 932 linear ft (welds)
course E	**≈ 1,664 sq ft (plates)**
	≈ 590 linear ft (welds)
course F	**≈ 491 sq ft (plates)**
	≈ 300 linear ft (welds)
Extension	**≈ 4,712 sq ft (plates)**
	≈ 2,094 linear ft (welds)
Barrel	**≈ 43,668 sq ft (plates)**
	≈ 11,346 linear ft (welds)
Lower Dome	**≈ 19,190 sq ft (plates)**
	≈ 4,959 linear ft (welds)
course 4	**≈ 5,634 sq ft (plates)**

2.0 UNIT DETAILS
Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

	≈ 1,569 linear ft (welds)
course 3	**≈ 5,797 sq ft (plates)**
	≈ 1,208 linear ft (welds)
course 2	**≈ 4,573 sq ft (plates)**
	≈ 1,135 linear ft (welds)
course 1	**≈ 2,695 sq ft (plates)**
	≈ 1,047 linear ft (welds)
base:	**≈ 491 sq ft (plates)**
	≈ 169 linear ft (welds)

Percent surface area of Tank #2 inspected	**≈ 100%**
Surface area of Upper Dome inspected	**≈ 100%**
Surface area of Barrel inspected	**≈ 100%**
Surface area of Lower Dome inspected	**≈ 100%**

Tank Numbering System — See **3.0 TANK MAP**

	Totals
Defect distribution	
Tank #20	518
Area	
Upper Dome	188
Extension	128
Barrel	60
Lower Dome	142
Floor	2
Type	
Underside corrosion	71
Through holes	1
Topside (pits gouges)	17
Dents/bulges	18
Weld: LOF/IP	125
Weld: Cracking	1
Weld: Misc. (WP, TW, etc.)	12
Grout Nozzles	273

2.0 UNIT DETAILS

Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

<u>Test Equipment</u>:

Electronics:
TS-2000, 8 Channel Plate Scanner
Hawkeye, Single Channel Pencil Probe Weld Scanner

Hardware:
U.T. Viper (Magnetic manual Crawler)

Ultrasonic Thickness Meter:
DMS-2 Krautkramer (with A-Scan Display)

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

TesTex
WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 1

Flaw # - Type - Remaining:

#1 -Wall Loss (corner) - 0.236"R
#2 -Wall Loss (corner) - 0.240"R

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 3

Flaw # - Type - Remaining:

#3 -Wall Loss (corner) - 0.240"R

Drawing is not to scale

TesTex
WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 4

Flaw # - Type - Remaining:

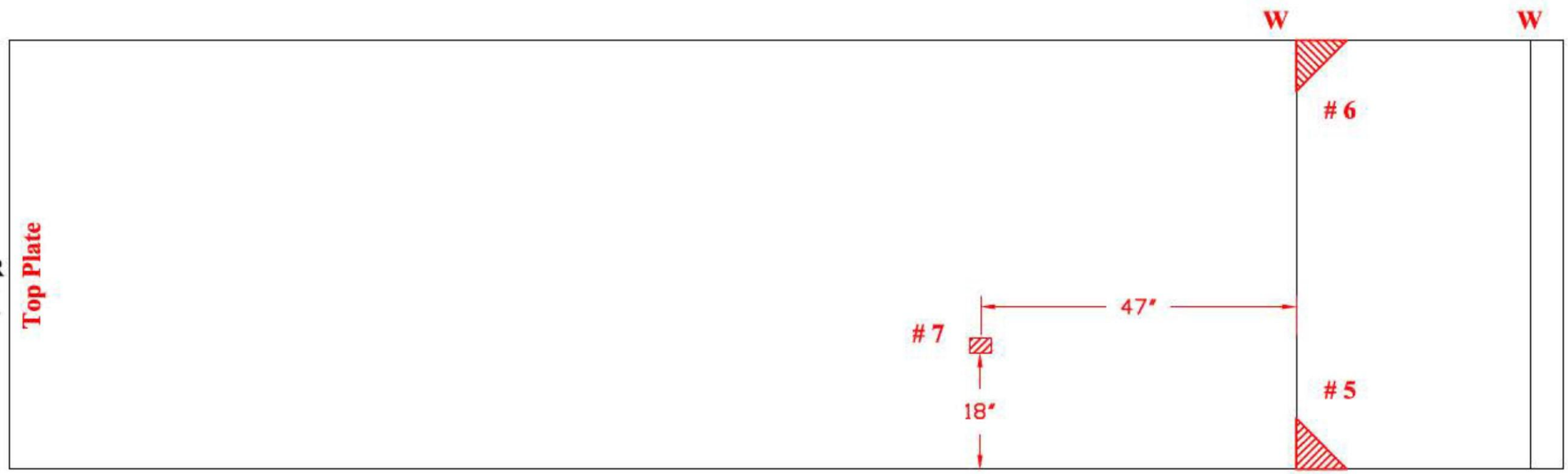
#4 -Wall Loss (corner) - 0.240"R

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 6

Flaw # - Type - Remaining:

#5 -Wall Loss (corner) - 0.240"R
#6 -Wall Loss (corner) - 0.240"R
#7 -Wall Loss - 0.240"R



Drawing is not to scale

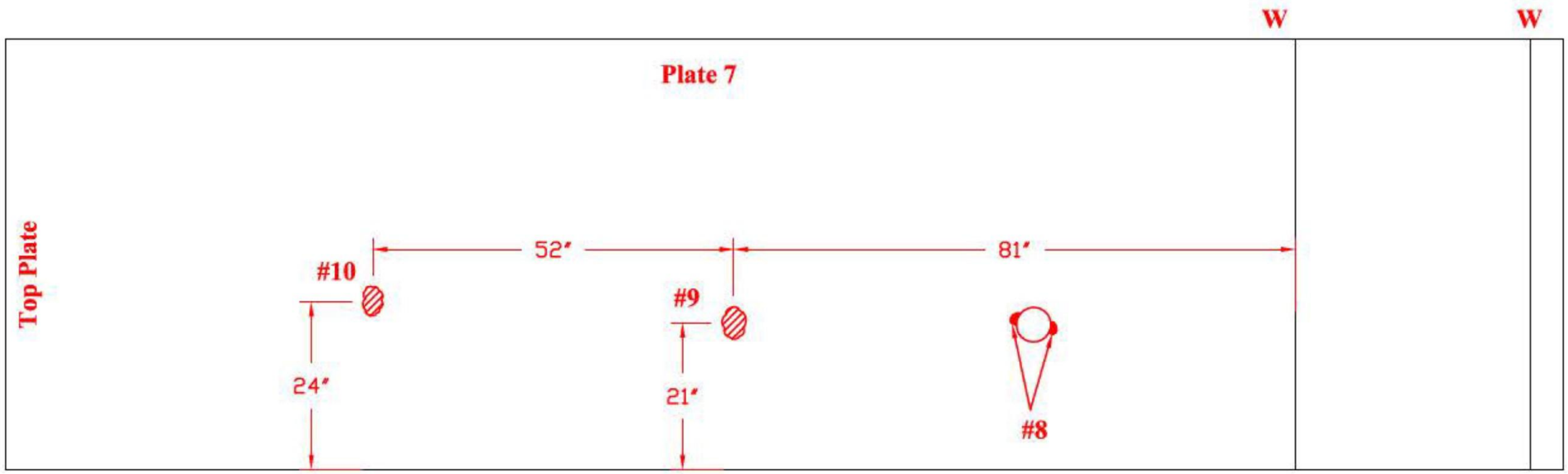
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 7

Flaw # - Type - Remaining:

#8 -Wall Loss (around PP) - 0.240"R
#9 -Wall Loss - 0.240"R
#10 -Wall Loss - 0.241"R

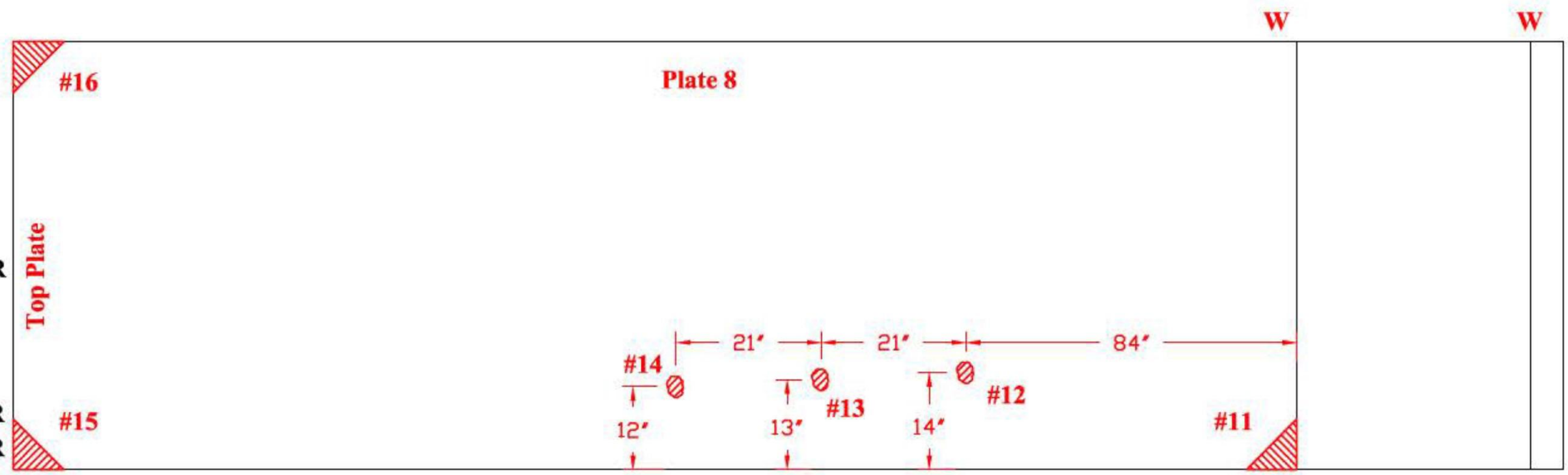


Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 8

Flaw # - Type - Remaining:

#11-Wall Loss (corner) - 0.240"R
#12-Wall Loss - 0.239"R
#13-Wall Loss - 0.241"R
#14-Wall Loss - 0.242"R
#15-Wall Loss(corner) - 0.240"R
#16-Wall Loss(corner) - 0.237"R



Drawing is not to scale

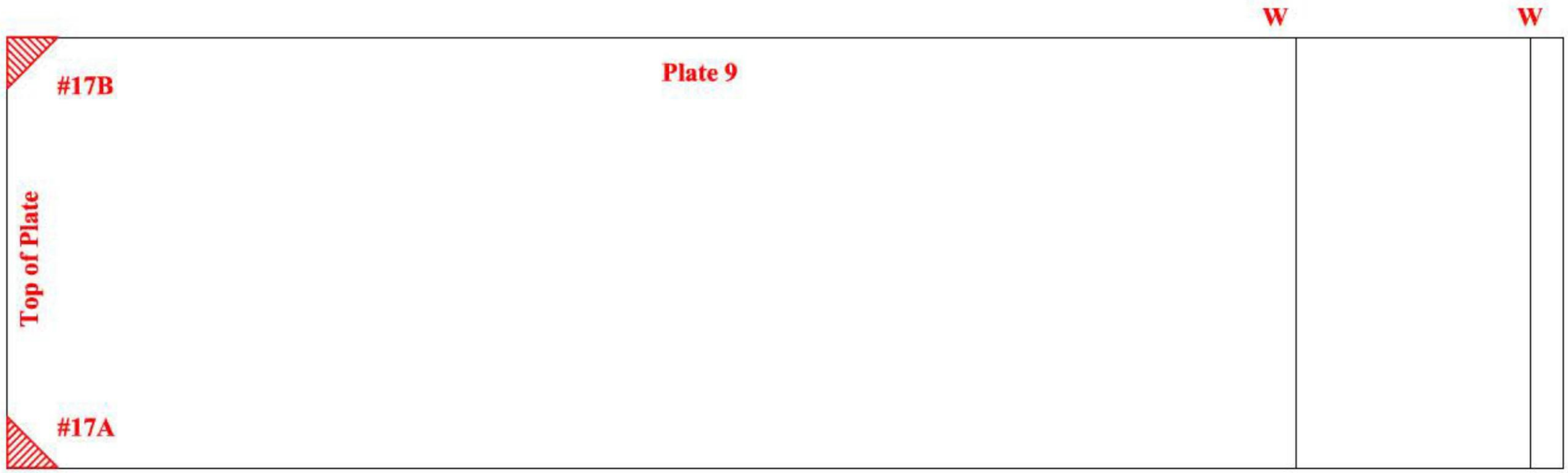
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 9

Flaw # - Type - Remaining:

#17A -Wall Loss (corner)
- 0.237"R
#17B -Wall Loss (corner)
- 0.240"R

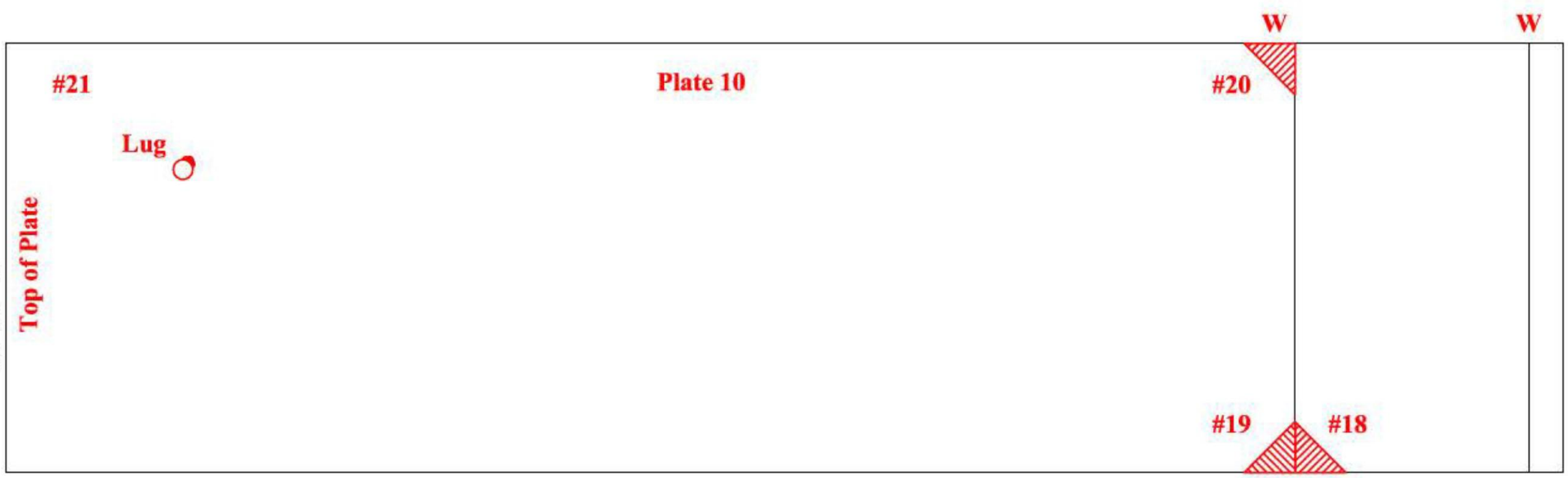


Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 10

Flaw # - Type - Remaining:

#18-Wall Loss (corner) - 0.238"R
#19-Wall Loss (corner) - 0.240"R
#20-Wall Loss (corner) - 0.240"R
#21-Wall Loss (around lug)
- 0.235"R



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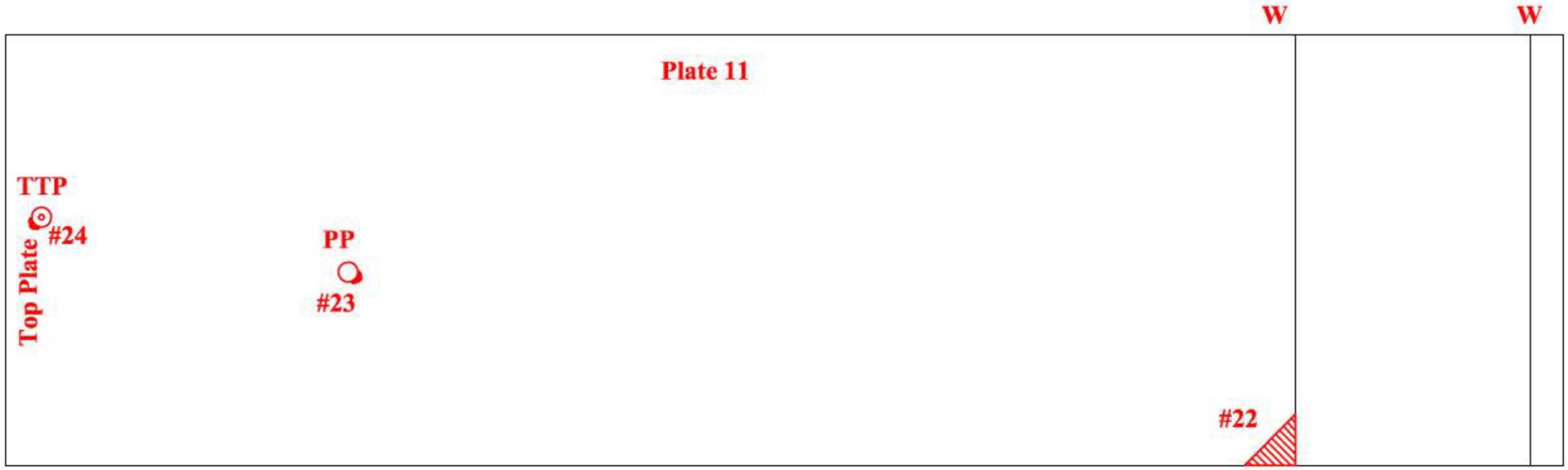
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 1
Plate #: 11

Flaw # - Type - Remaining:

#22 -Wall Loss (corner) - 0.240"R
#23 -Wall Loss (around PP) - 0.237"R
#24 -Wall Loss (around PP) - 0.237"R



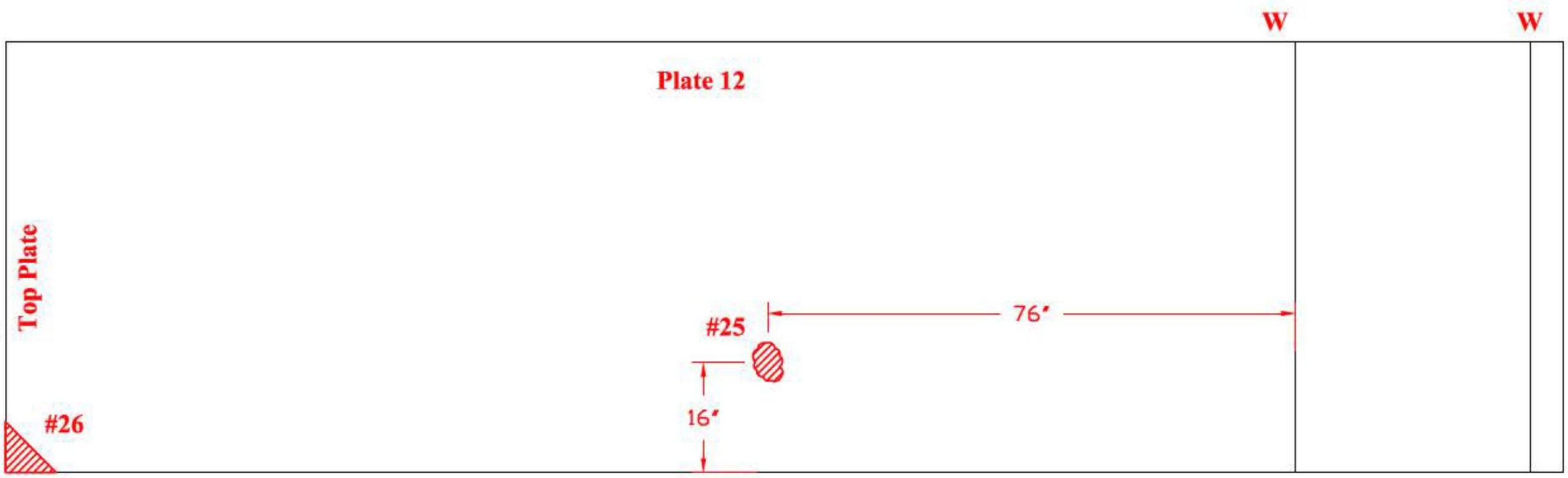
Tank Section: Lower Dome
Quadrant: B

Course: 1
Plate #: 12

Flaw # - Type - Remaining:

#25-Wall Loss - 0.242"R

#26-Wall Loss (corner) - 0.237"R



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TANK # 20 - QUADRANT B

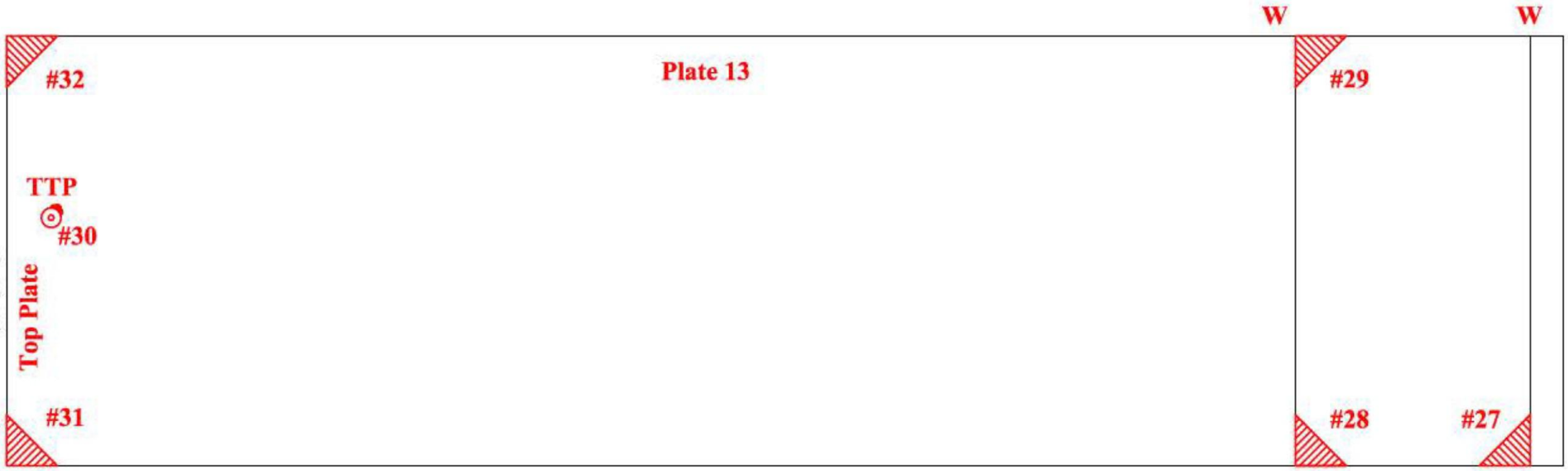
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: B

Course: 1
Plate #: 13

Flaw # - Type - Remaining:

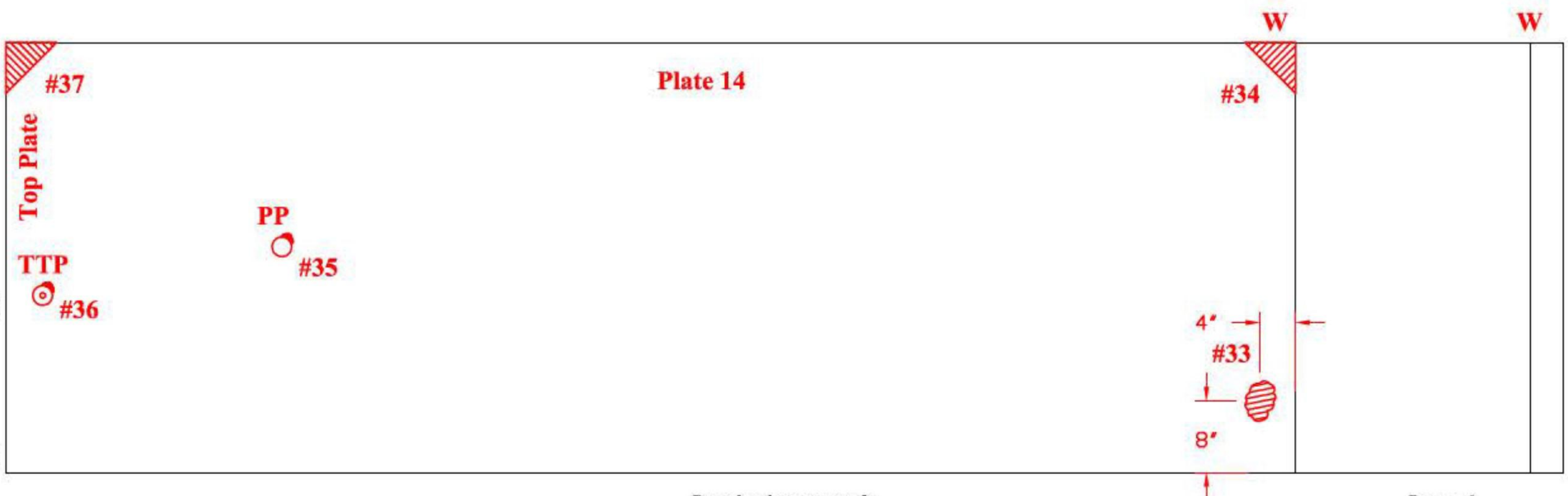
#27-Wall Loss (corner)- 0.234"R
#28-Wall Loss (corner)- 0.228"R
#29-Wall Loss (corner)- 0.240"R
#30-Wall Loss (around PP) - 0.240"R
#31-Wall Loss (corner)- 0.240"R
#32-Wall Loss (corner)- 0.239"R



Tank Section: Lower Dome
Quadrant: B

Course: 1
Plate #: 14
Flaw # - Type - Remaining:

#33-Wall Loss - 0.240"R
#34-Wall Loss (corner)- 0.235"R
#35-Wall Loss (around PP) - 0.239"R
#36-Wall Loss (around PP) - 0.240"R
#37-Wall Loss (corner)- 0.240"R



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

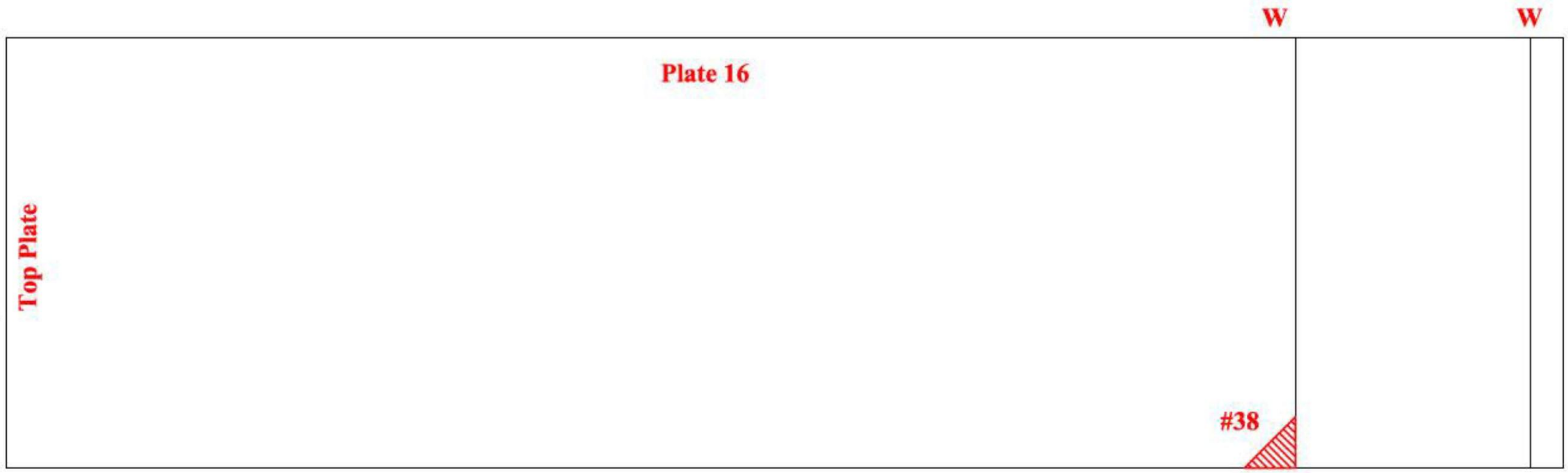
TANK # 20 - QUADRANT B
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: B

Course: 1
Plate #: 16

Flaw # - Type - Remaining:

#38-Wall Loss (corner)- 0.240"R

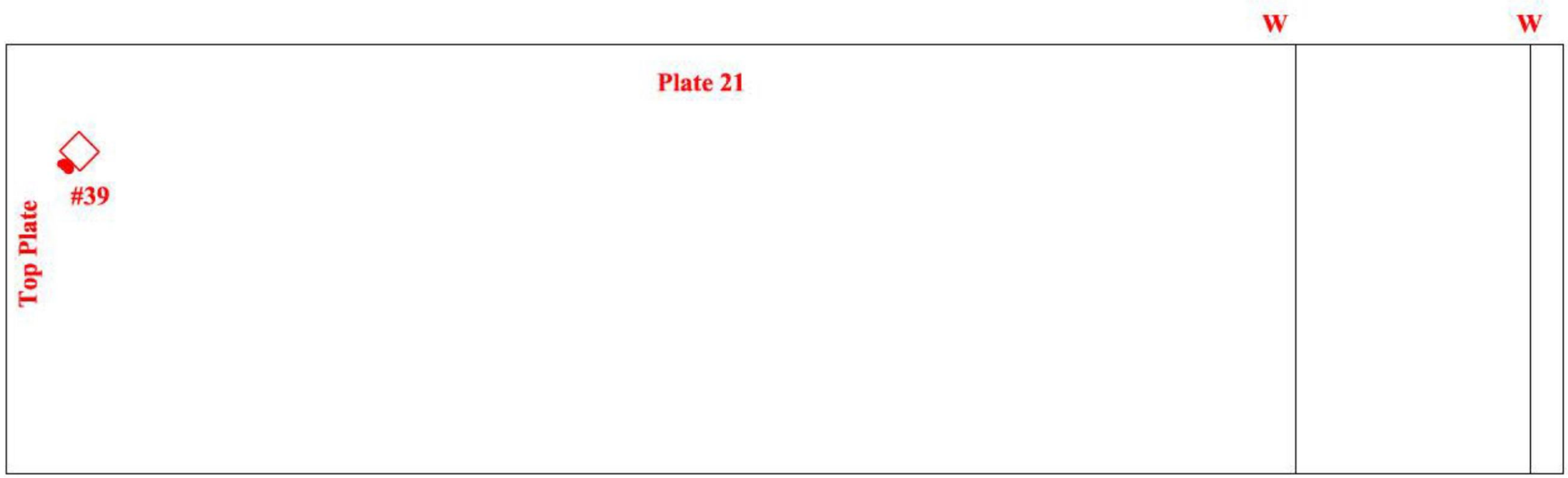


Tank Section: Lower Dome
Quadrant: B

Course: 1
Plate #: 21

Flaw # - Type - Remaining:

#39-Wall Loss (around diamond plate) - 0.244"R



Drawing is not to scale

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TANK # 20 - QUADRANT C

Nominal Plate Thickness: 0.250"

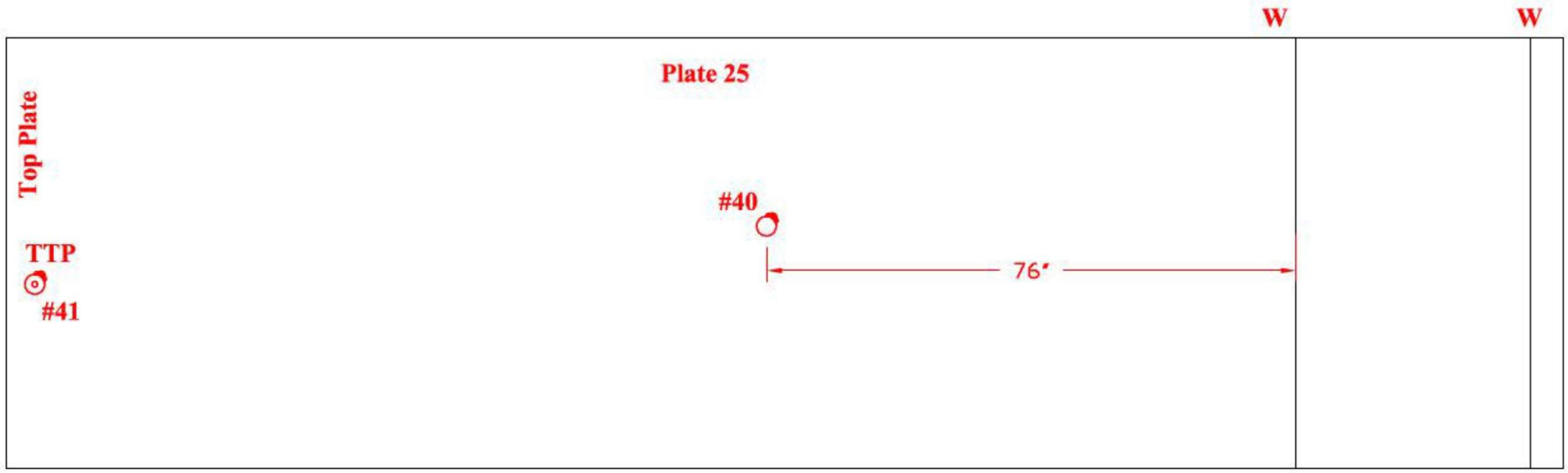
Tank Section: Lower Dome
Quadrant: C

Course: 1
Plate #: 25

Flaw # - Type - Remaining:

#40-Wall Loss (around PP)
- 0.243"R

#41-Wall Loss (around PP)
- 0.241"R

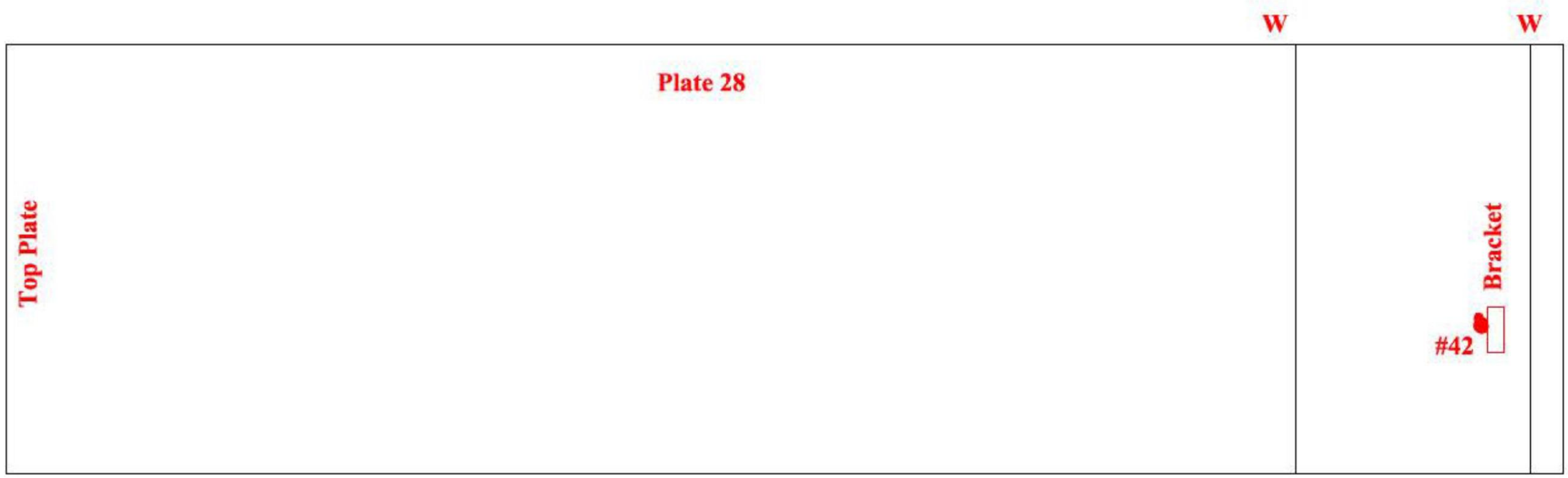


Tank Section: Lower Dome
Quadrant: C

Course: 1
Plate #: 28

Flaw # - Type - Remaining:

#42-Wall Loss (around bracket)
- 0.238"R



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

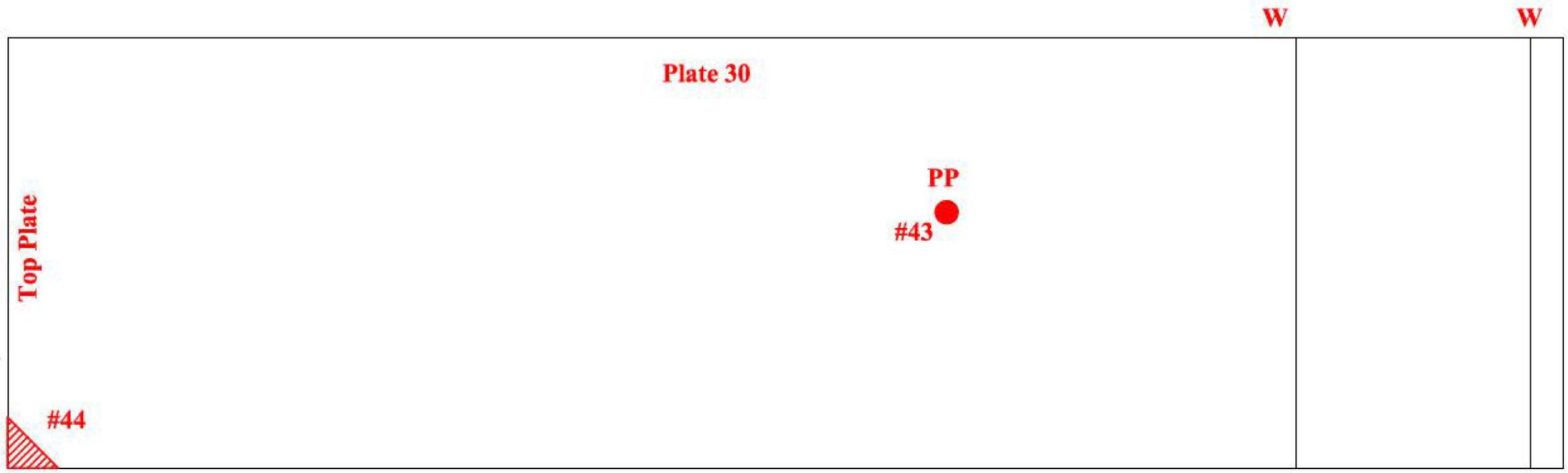
TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: C

Course: 1
Plate #: 30

Flaw # - Type - Remaining:

#43-Wall Loss (PP) - 0.239"R
#44-Wall Loss (corner)- 0.238"R

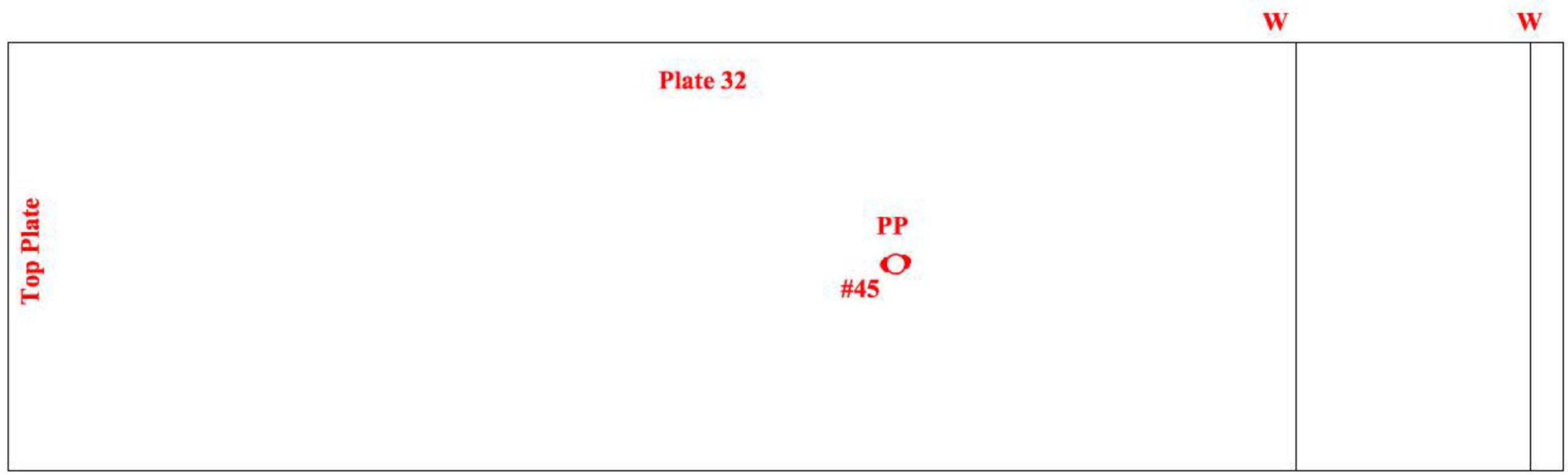


Tank Section: Lower Dome
Quadrant: C

Course: 1
Plate #: 32

Flaw # - Type - Remaining:

#45-Wall Loss (around PP)
- 0.237 - 0.240"R



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TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 37

Flaw # - Type - Remaining:

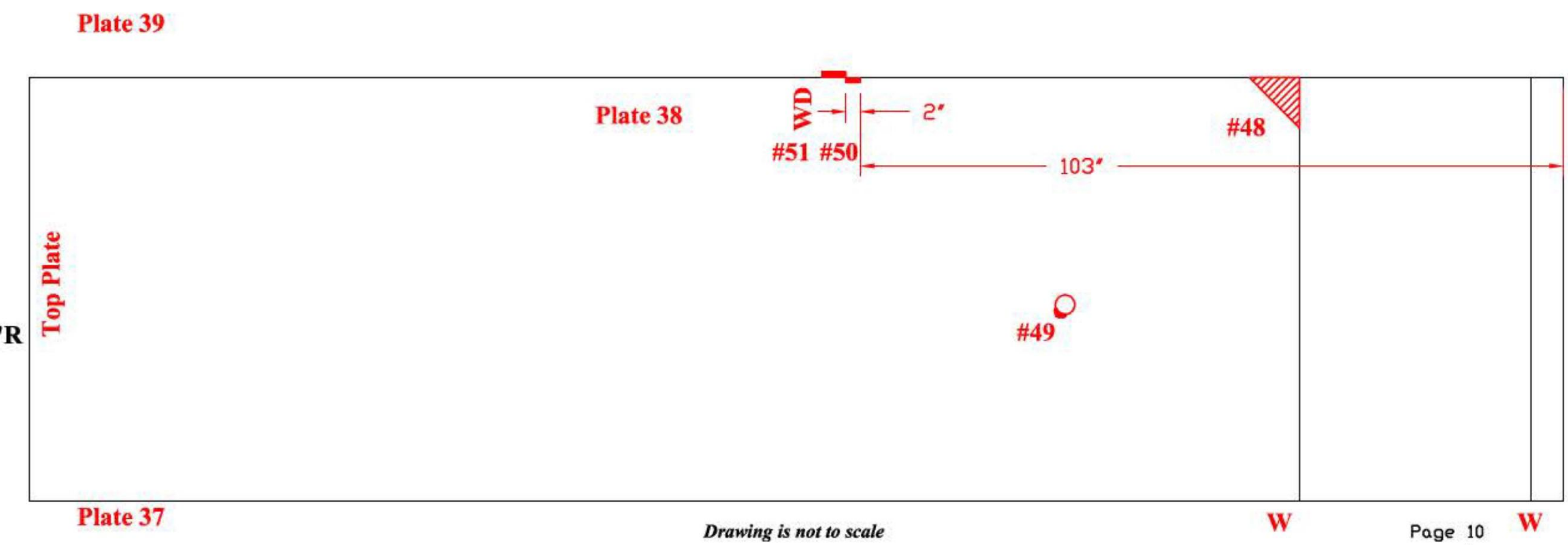
#46-Wall Loss (PP) - 0.240"R
#47: 1) LOF 0.120" D 6"L
2) LOF 0.189" D 4"L
3) LOF 0.125" D 8.5"L

Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 38

Flaw # - Type - Remaining:

#48-Wall Loss (corner) - 0.240"R
#49-Wall Loss (around PP)
- 0.237"R
#50- LOF 0.089" D 2"L
#51- LOF 0.118" D 11.5"L



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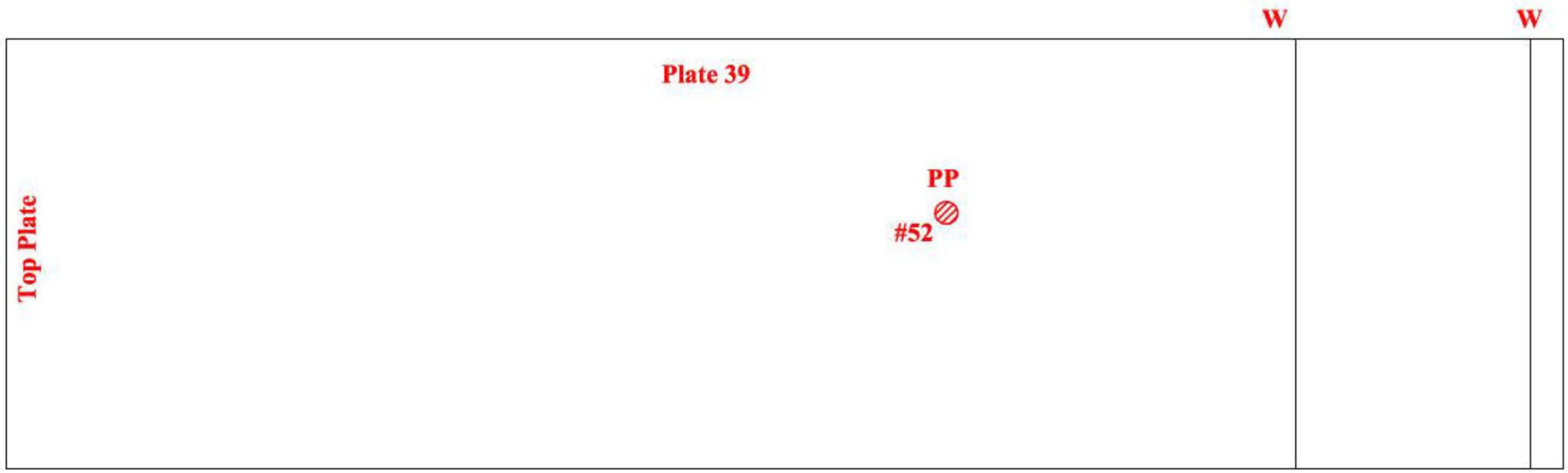
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 39

Flaw # - Type - Remaining:

#52-Wall Loss (PP) - 0.230"R

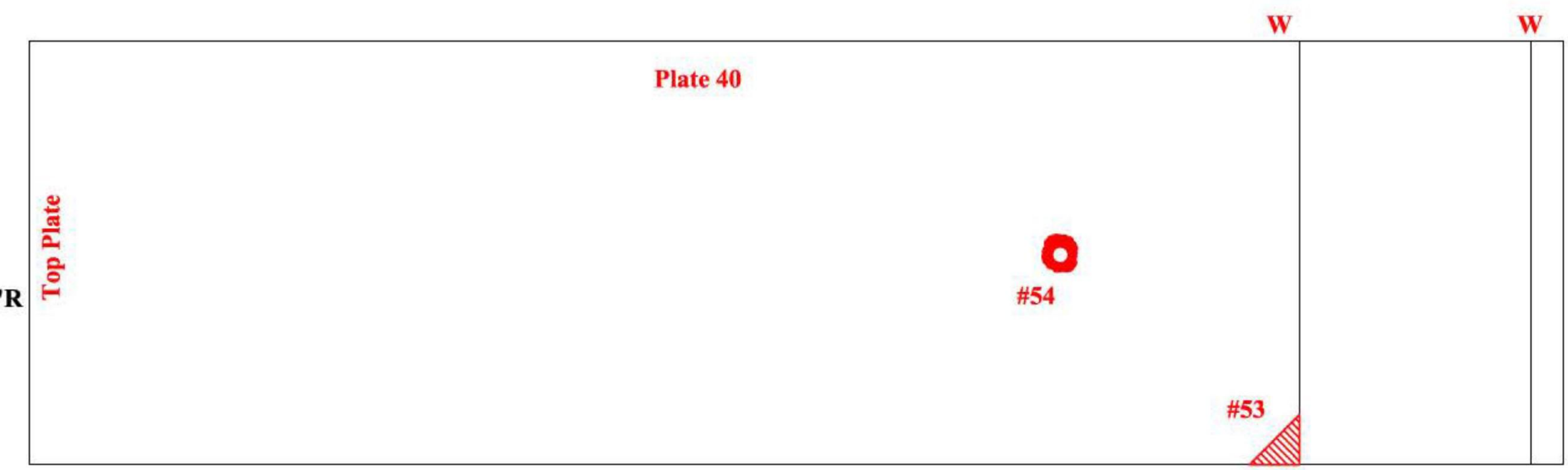


Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 40

Flaw # - Type - Remaining:

#53-Wall Loss (corner) - 0.240"R
#54-Wall Loss (around PP)
- 0.238" - 0.240"R



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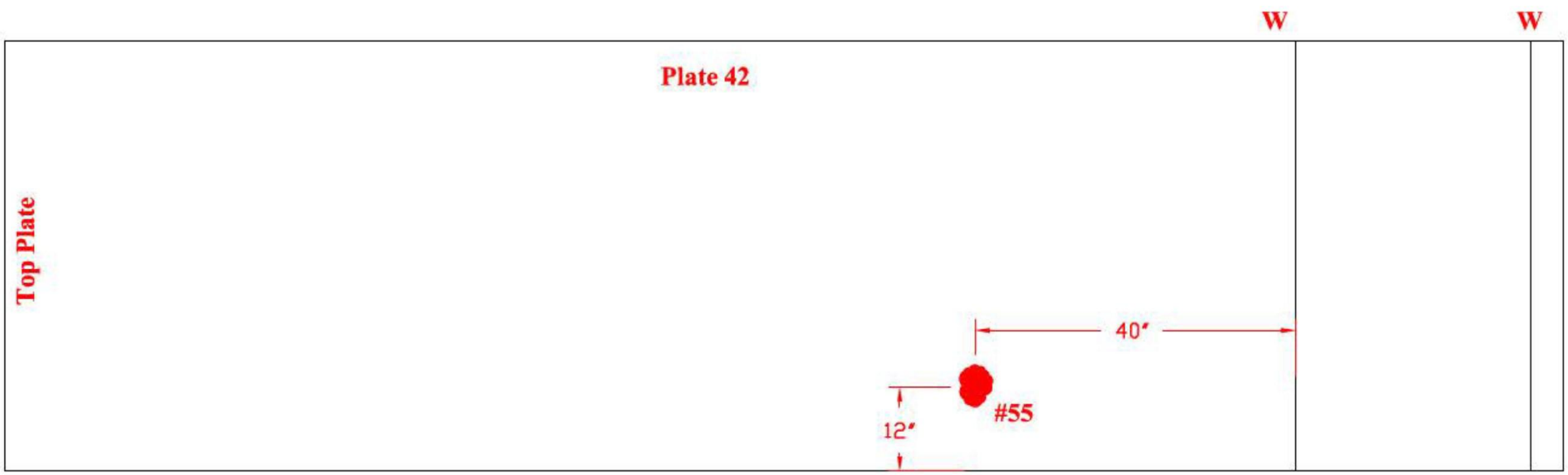
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 42

Flaw # - Type - Remaining:

#55-Wall Loss - 0.240"R

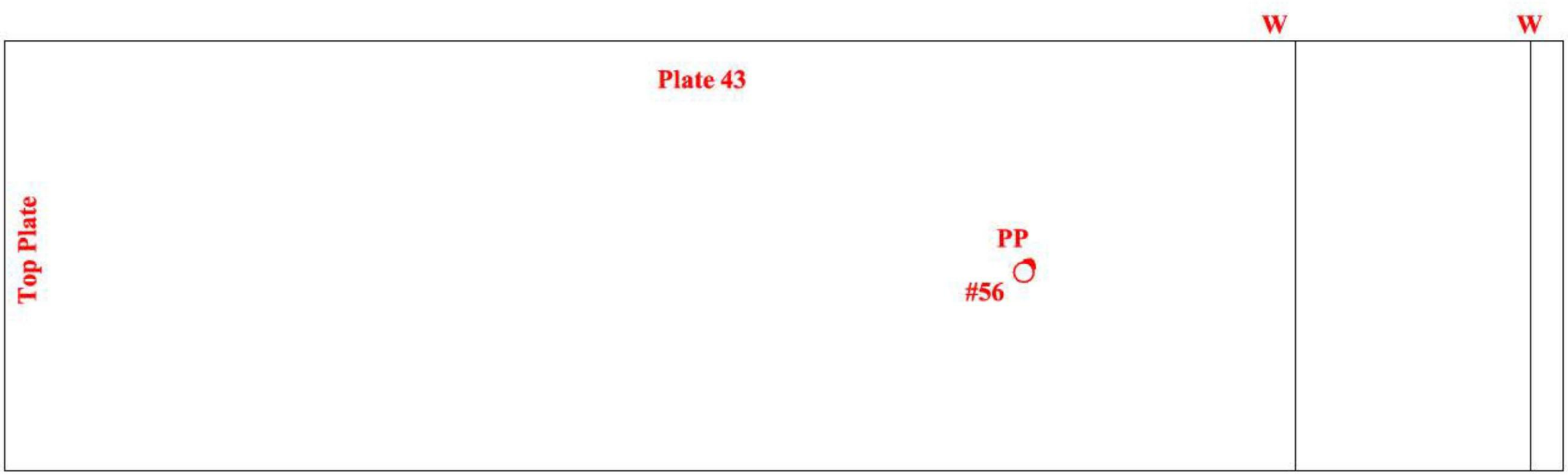


Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 43

Flaw # - Type - Remaining:

#56-Wall Loss (around PP)
- 0.240"R



Drawing is not to scale

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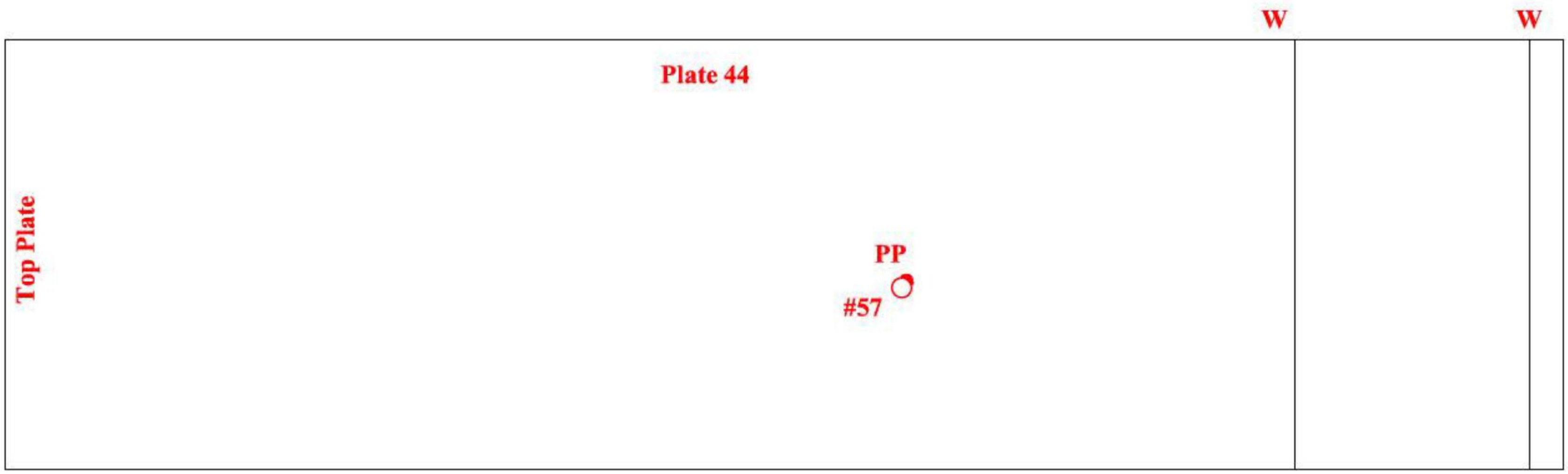
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 1
Plate #: 44

Flaw # - Type - Remaining:

#57-Wall Loss (around PP)
- 0.240"R



Drawing is not to scale

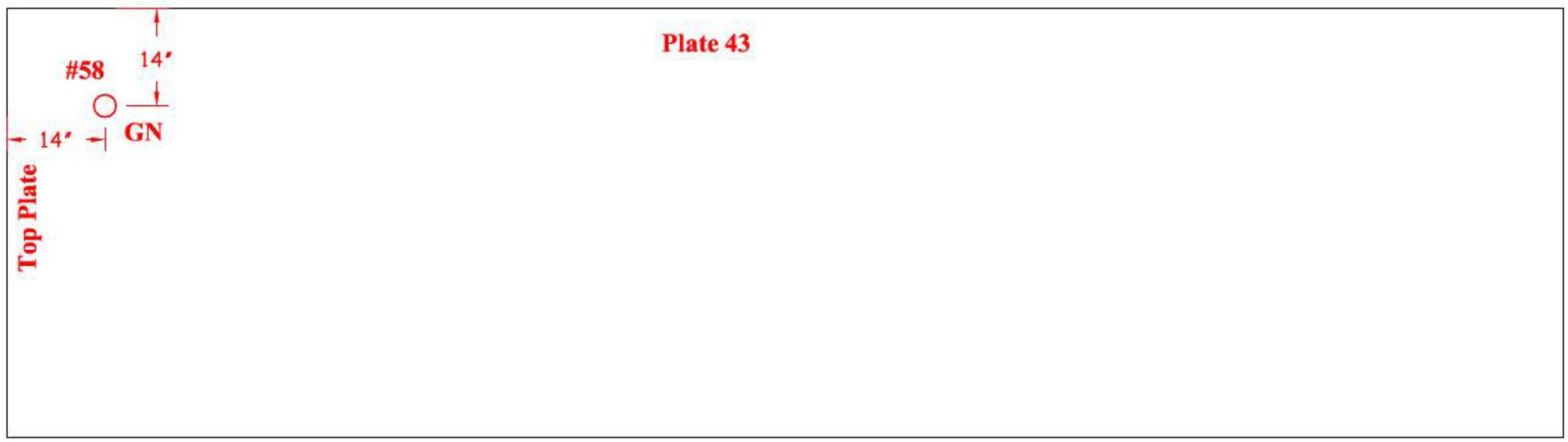
TANK # 20 - QUADRANT D
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 43

Flaw # - Type - Remaining:

#58 - Grout Nozzle - 0.210"R

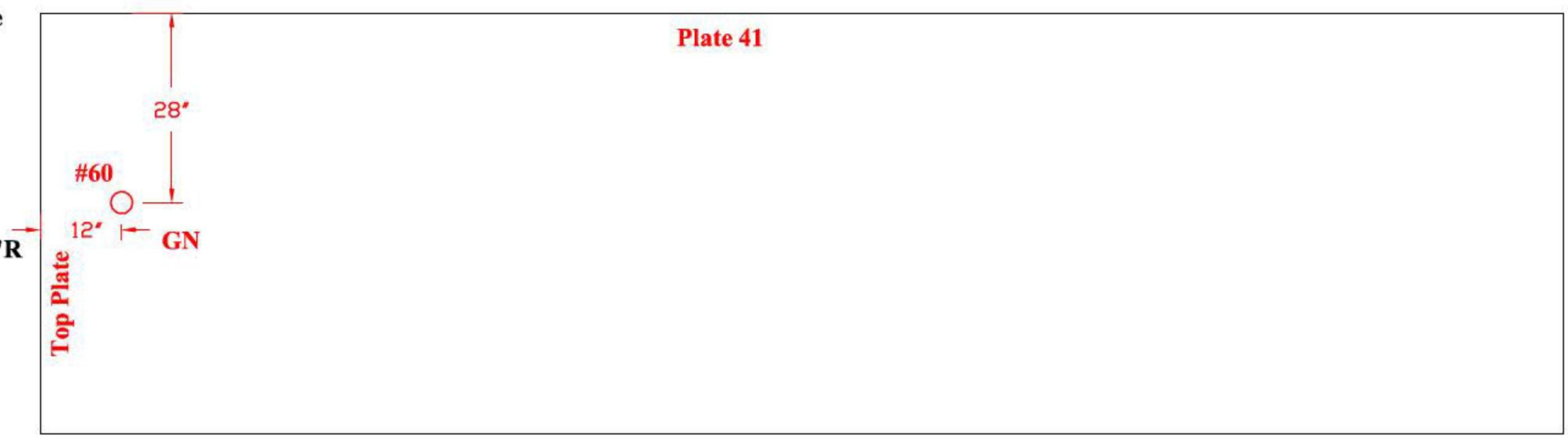


Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 41

Flaw # - Type - Remaining:

#60 - Grout Nozzle - 0.198"R



Drawing is not to scale

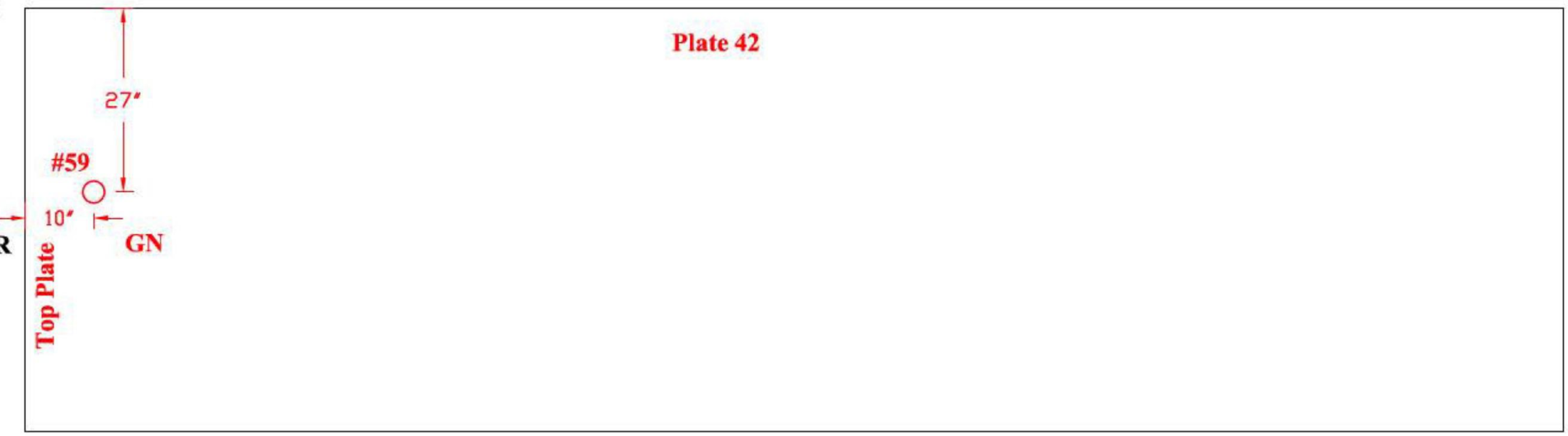
TANK # 20 - QUADRANT B AND D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 42

Flaw # - Type - Remaining:

#59 - Grout Nozzle - 0.230"R

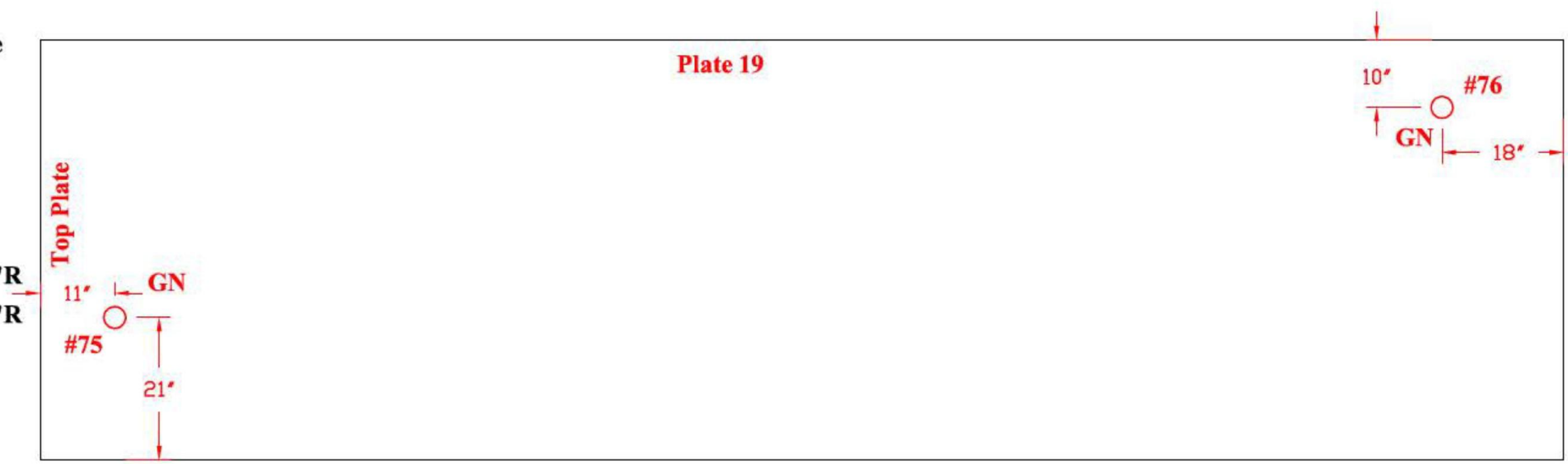


Tank Section: Lower Dome
Quadrant: B

Course: 2
Plate #: 19

Flaw # - Type - Remaining:

#75 - Grout Nozzle - 0.208"R
#76 - Grout Nozzle - 0.224"R



Drawing is not to scale

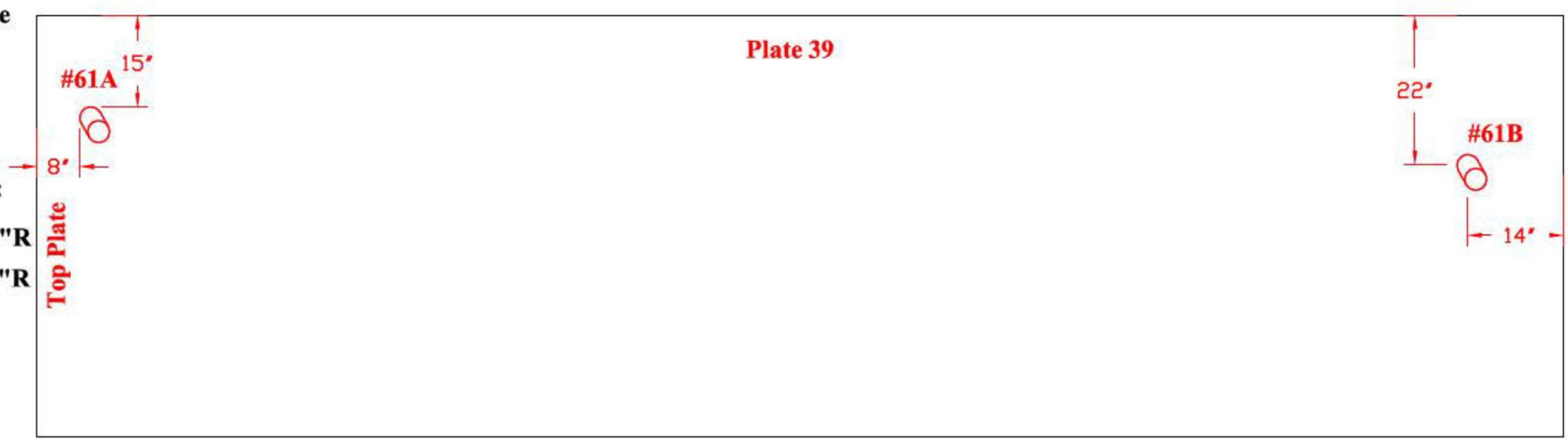
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 39

Flaw # - Type - Remaining:

#61A - Grout Nozzle - 0.208"R
#61B - Grout Nozzle - 0.218"R

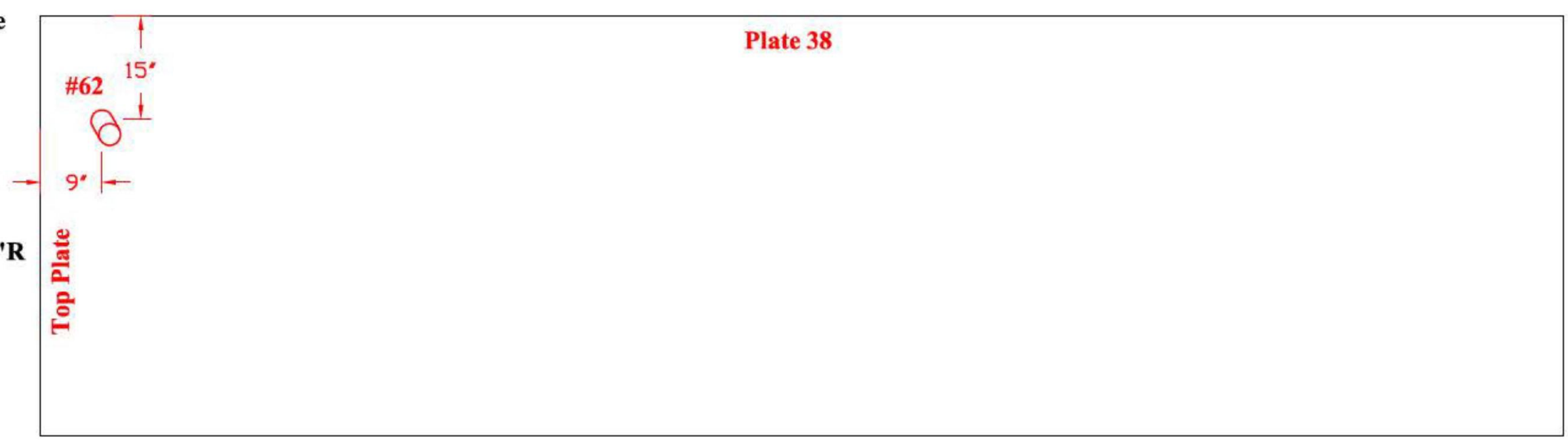


Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 38

Flaw # - Type - Remaining:

#62 - Grout Nozzle - 0.208"R



Drawing is not to scale

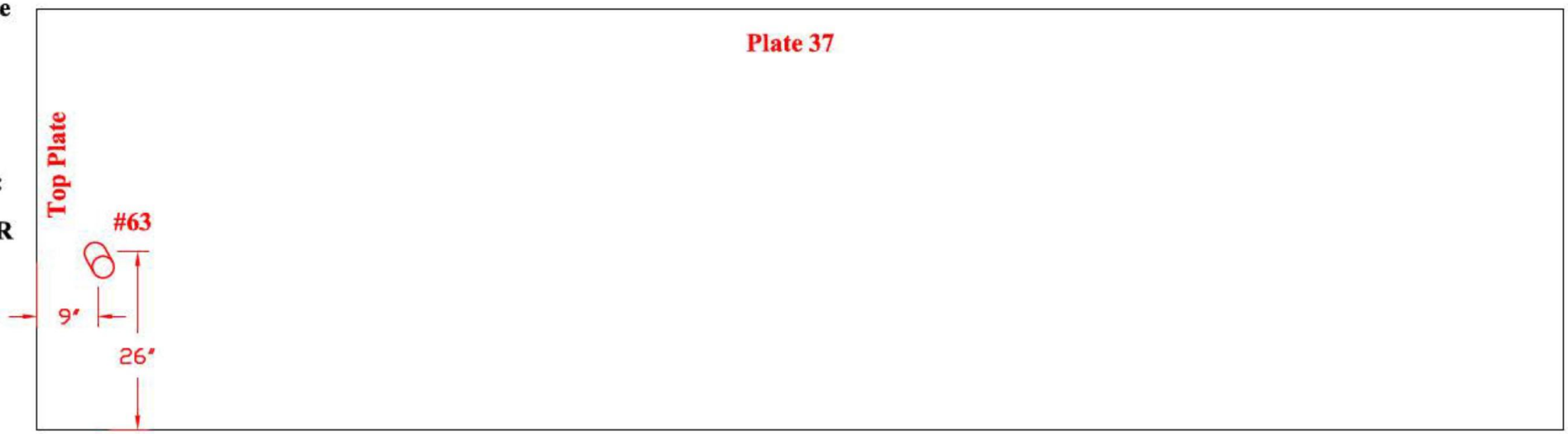
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 37

Flaw # - Type - Remaining:

#63 - Grout Nozzle - 0.228"R

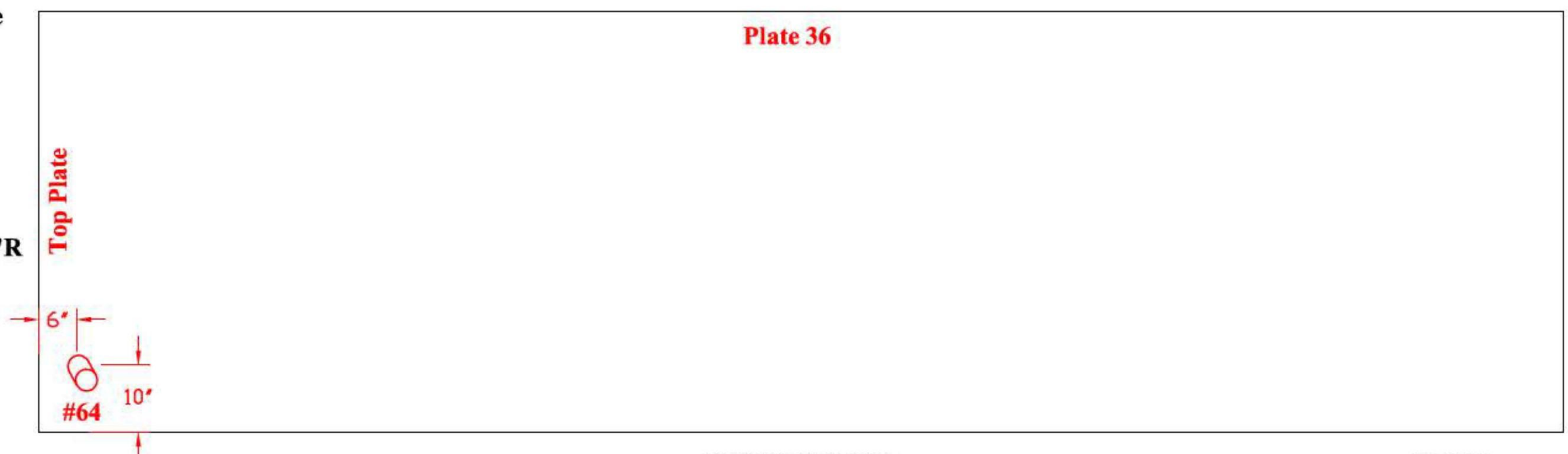


Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 36

Flaw # - Type - Remaining:

#64 - Grout Nozzle - 0.209"R



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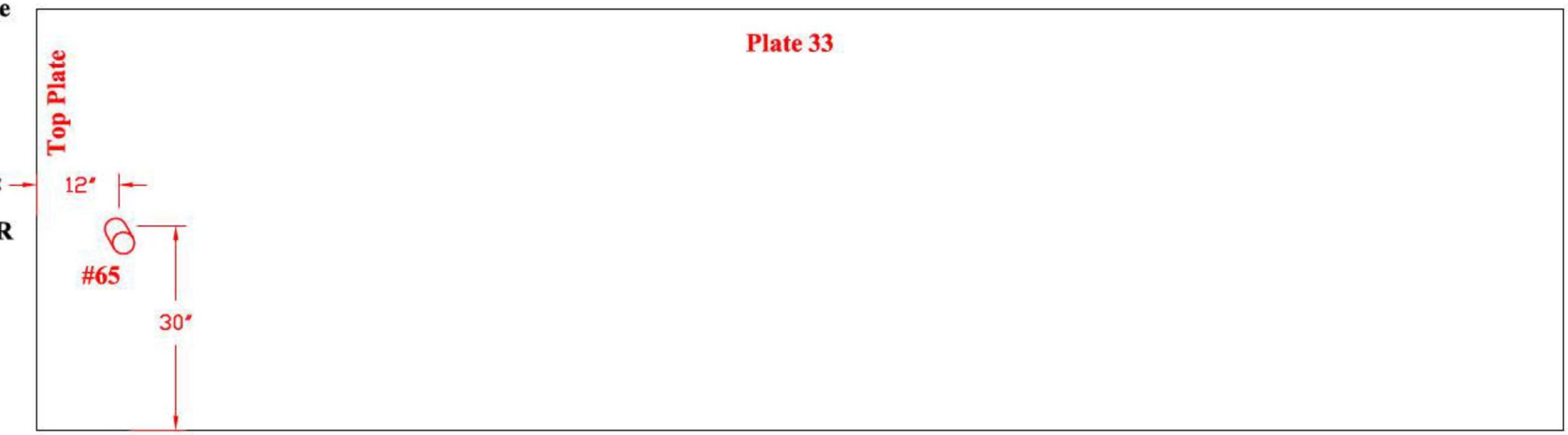
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 33

Flaw # - Type - Remaining:

#65 - Grout Nozzle - 0.220"R

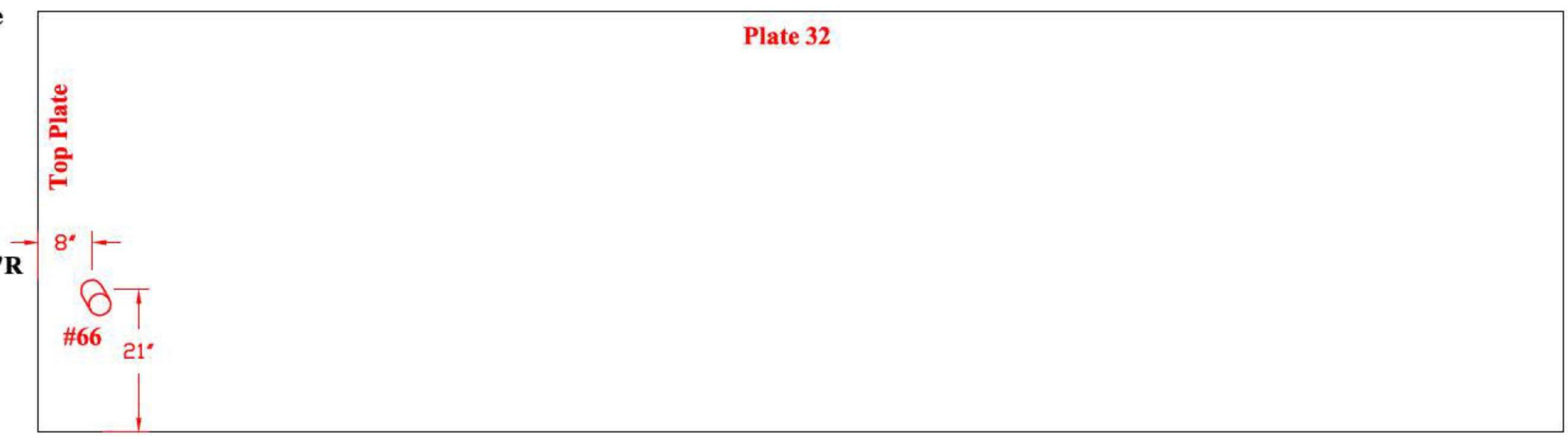


Tank Section: Lower Dome
Quadrant: D

Course: 2
Plate #: 32

Flaw # - Type - Remaining:

#66 - Grout Nozzle - 0.207"R



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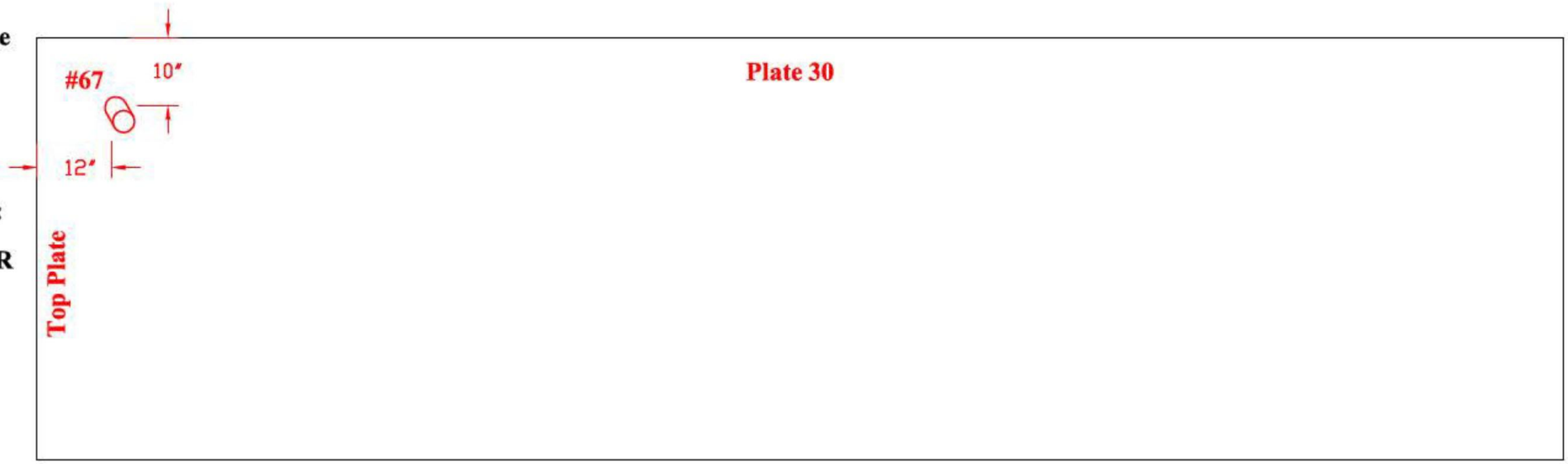
TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: C

Course: 2
Plate #: 30

Flaw # - Type - Remaining:

#67 - Grout Nozzle - 0.220"R

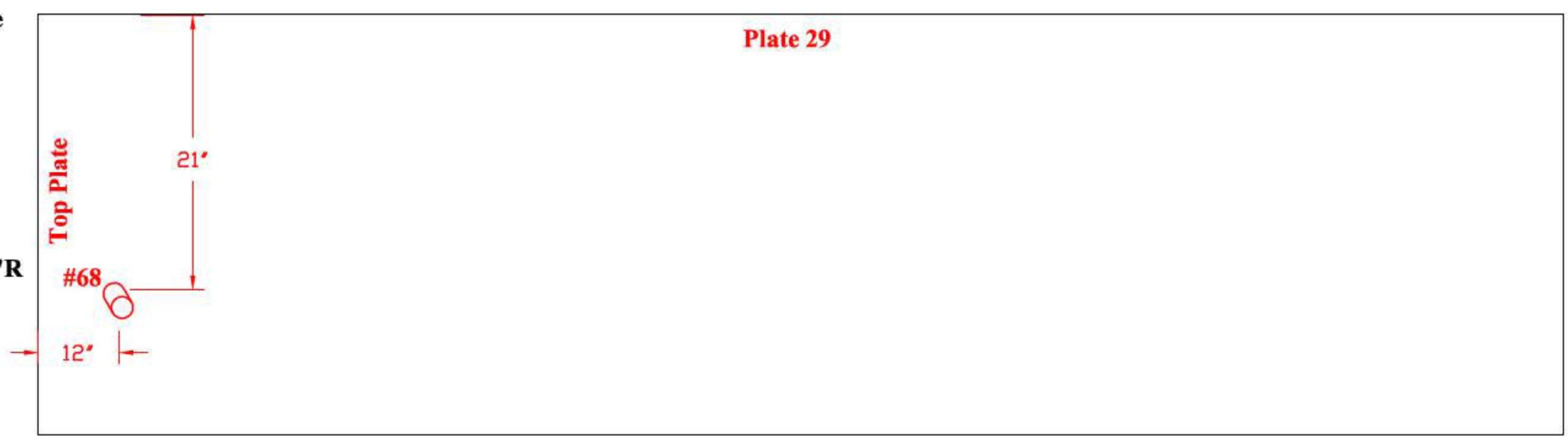


Tank Section: Lower Dome
Quadrant: C

Course: 2
Plate #: 29

Flaw # - Type - Remaining:

#68 - Grout Nozzle - 0.212"R



Drawing is not to scale

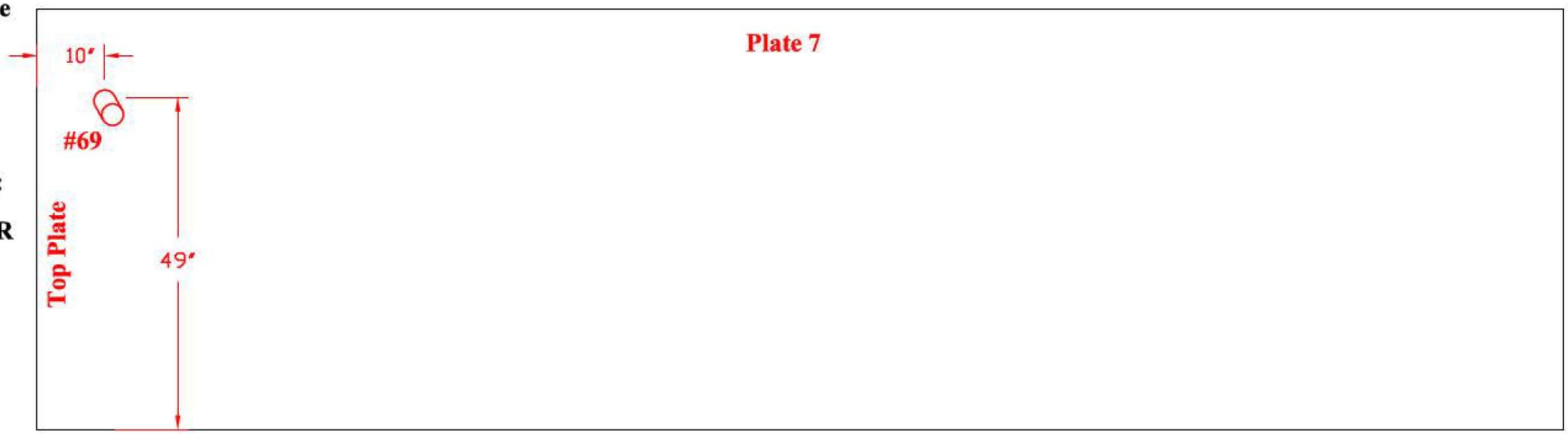
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 2
Plate #: 7

Flaw # - Type - Remaining:

#69 - Grout Nozzle - 0.200"R

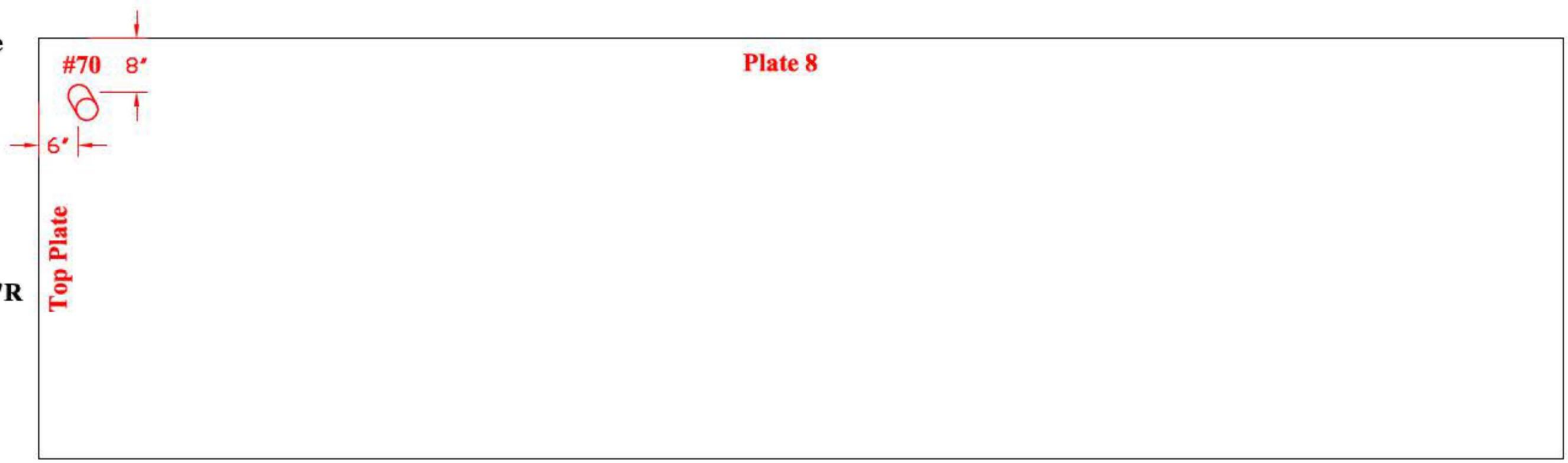


Tank Section: Lower Dome
Quadrant: A

Course: 2
Plate #: 8

Flaw # - Type - Remaining:

#70 - Grout Nozzle - 0.220"R



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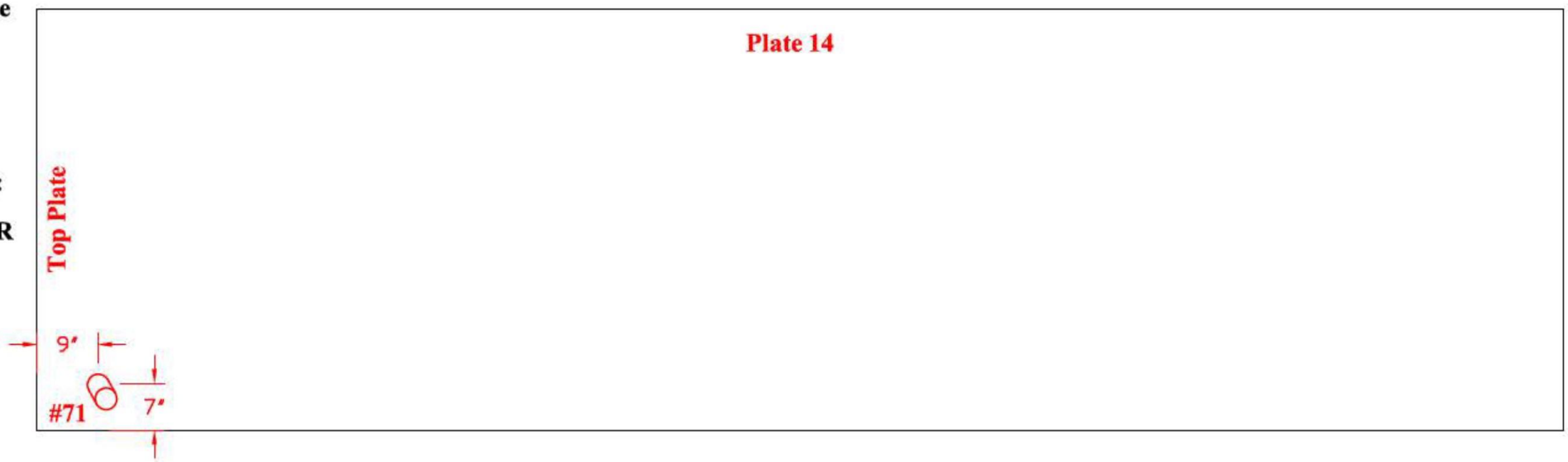
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: B

Course: 2
Plate #: 14

Flaw # - Type - Remaining:

#71 - Grout Nozzle - 0.212"R

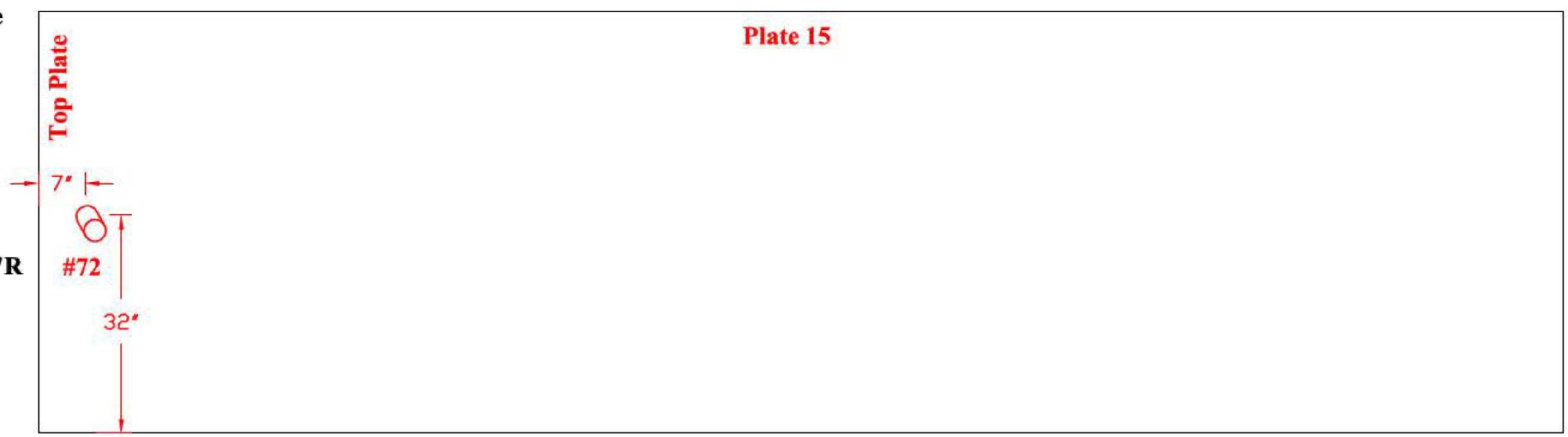


Tank Section: Lower Dome
Quadrant: B

Course: 2
Plate #: 15

Flaw # - Type - Remaining:

#72 - Grout Nozzle - 0.220"R



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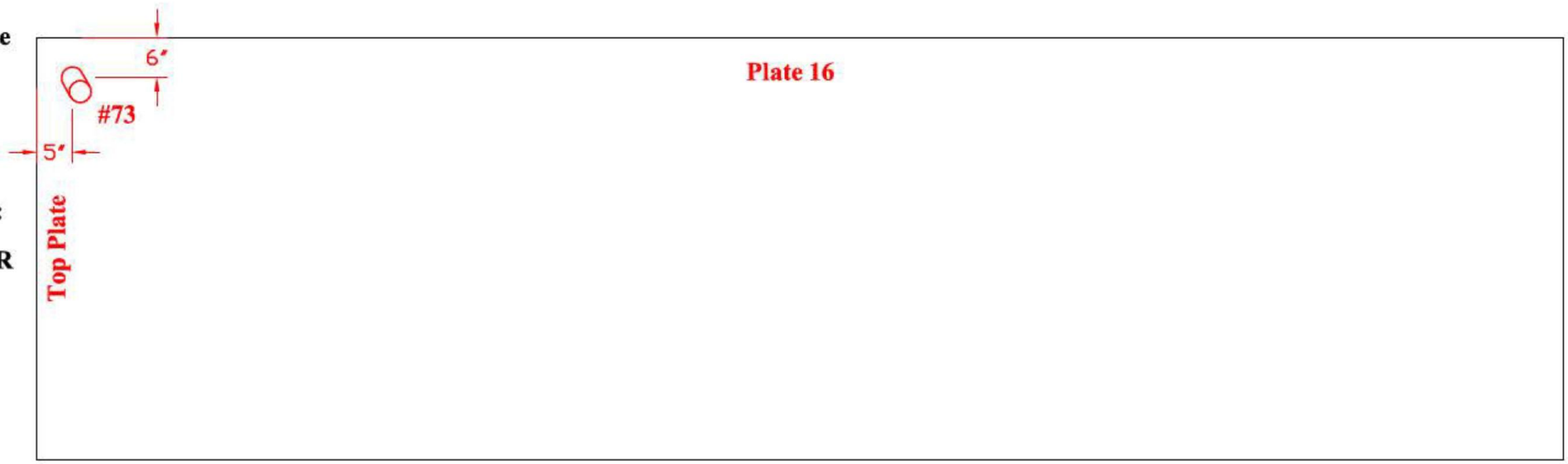
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: B

Course: 2
Plate #: 16

Flaw # - Type - Remaining:

#73 - Grout Nozzle - 0.215"R

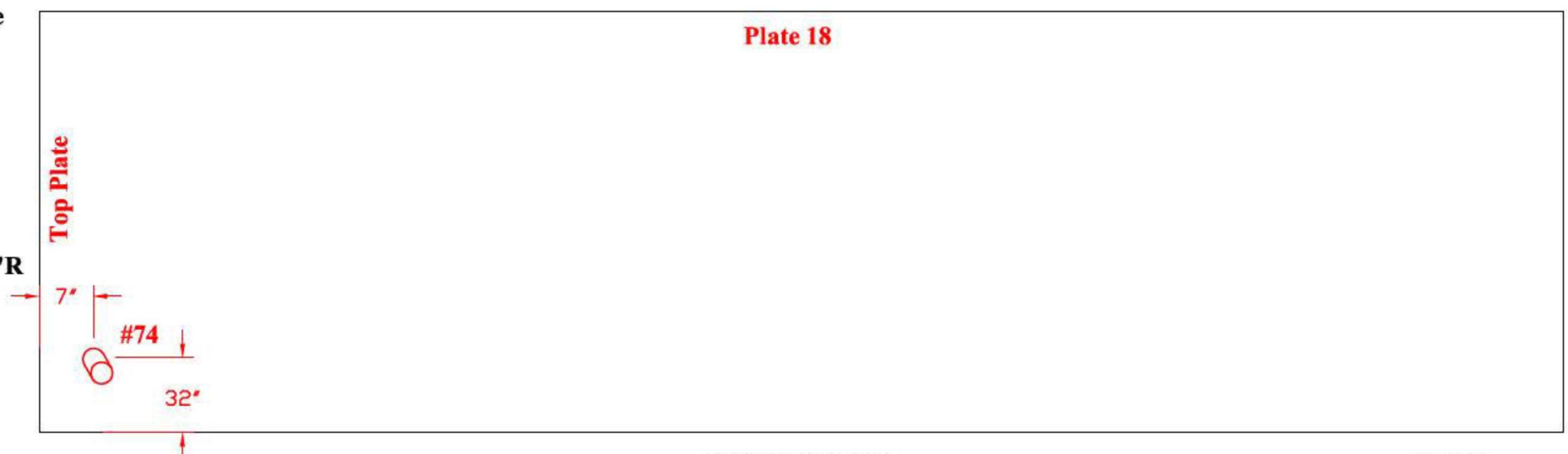


Tank Section: Lower Dome
Quadrant: B

Course: 2
Plate #: 18

Flaw # - Type - Remaining:

#74 - Grout Nozzle - 0.211"R



Drawing is not to scale

TANK # 20 - QUADRANT B

Nominal Plate Thickness: 0.250"

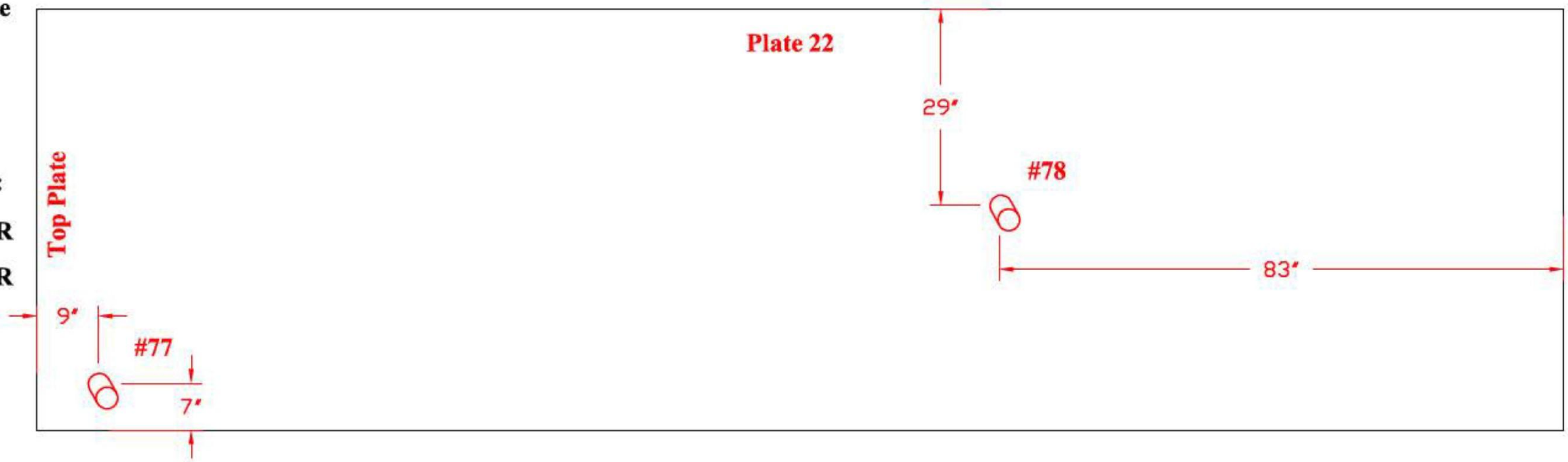
Tank Section: Lower Dome
Quadrant: B

Course: 3
Plate #: 22

Flaw # - Type - Remaining:

#77 - Grout Nozzle - 0.230"R

#78 - Grout Nozzle - 0.230"R

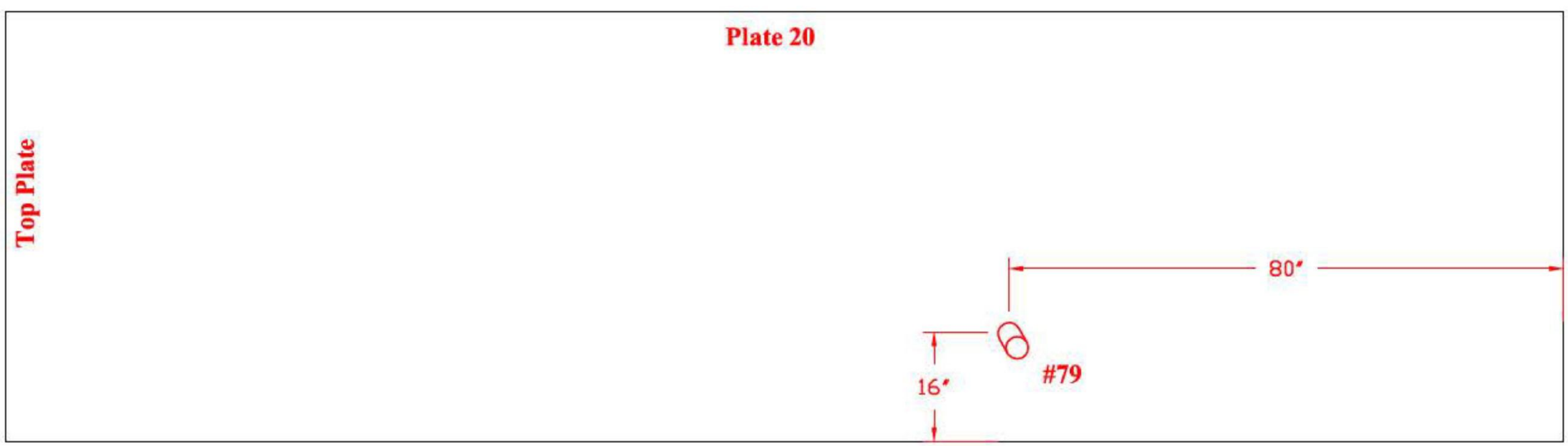


Tank Section: Lower Dome
Quadrant: B

Course: 3
Plate #: 20

Flaw # - Type - Remaining:

#79 - Grout Nozzle - 0.224"R



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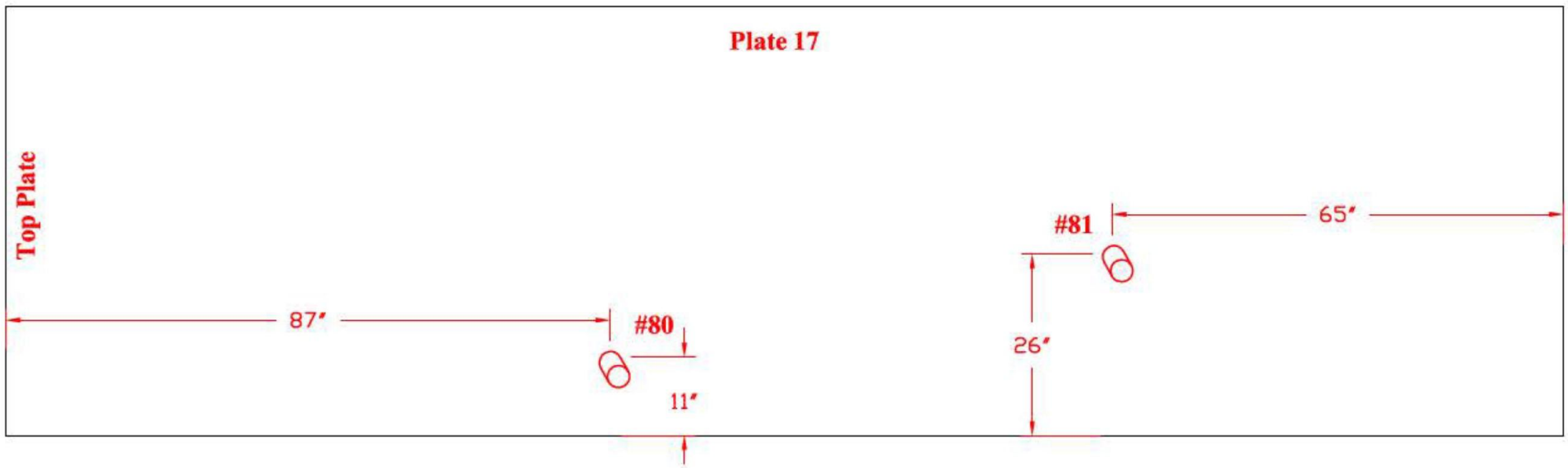
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: B

Course: 3
Plate #: 17

Flaw # - Type - Remaining:

#80 - Grout Nozzle - 0.212"R
#81 - Grout Nozzle - 0.220"R

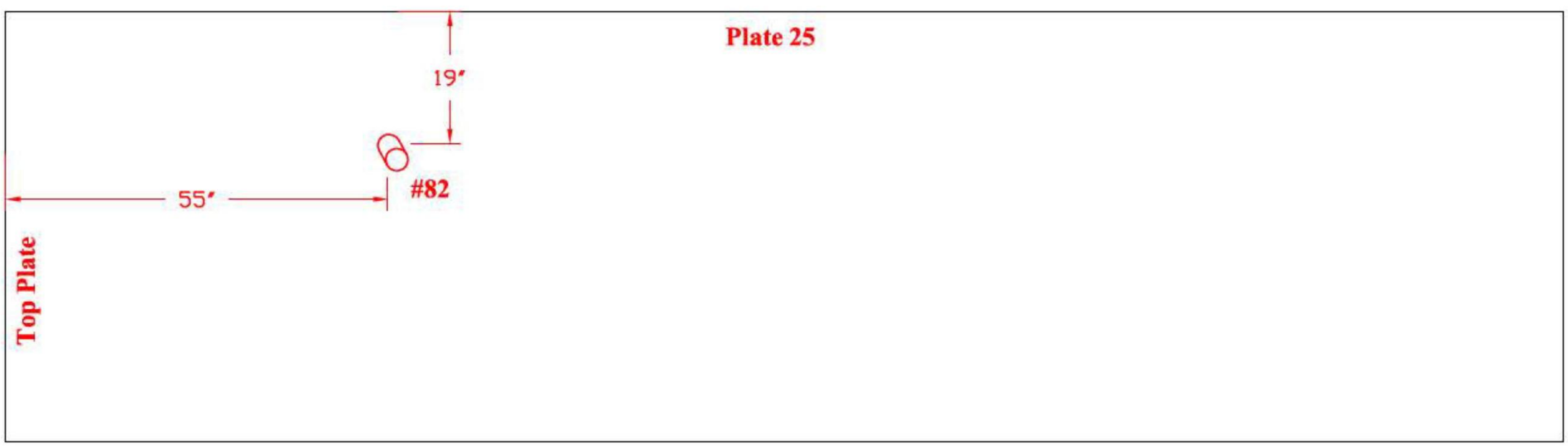


Tank Section: Lower Dome
Quadrant: B

Course: 4
Plate #: 25

Flaw # - Type - Remaining:

#82 - Grout Nozzle - 0.225"R



Drawing is not to scale

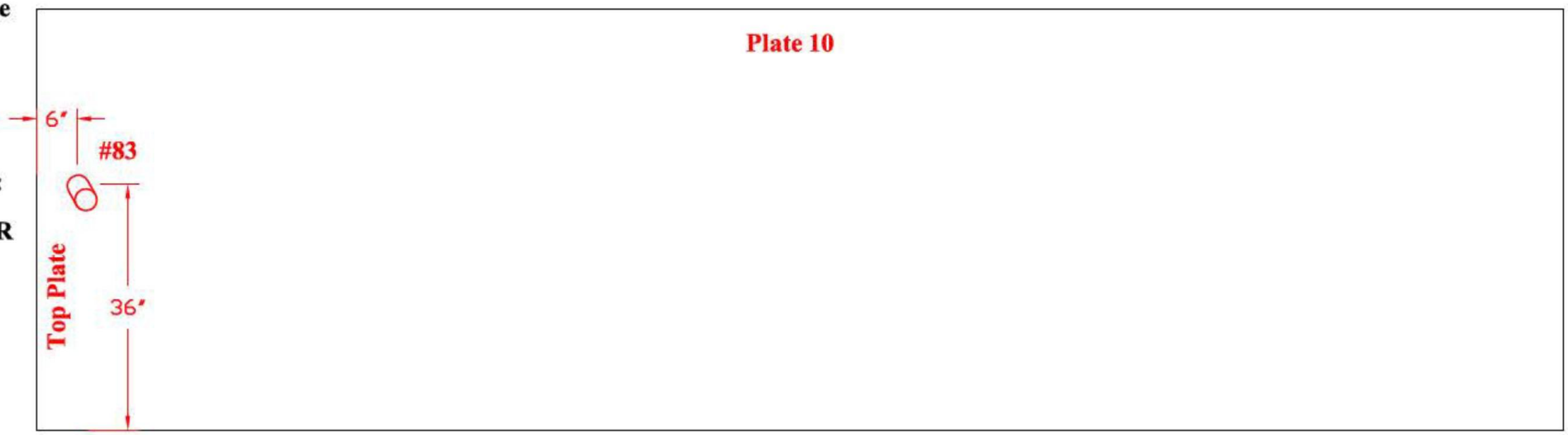
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 2
Plate #: 10

Flaw # - Type - Remaining:

#83 - Grout Nozzle - 0.236"R

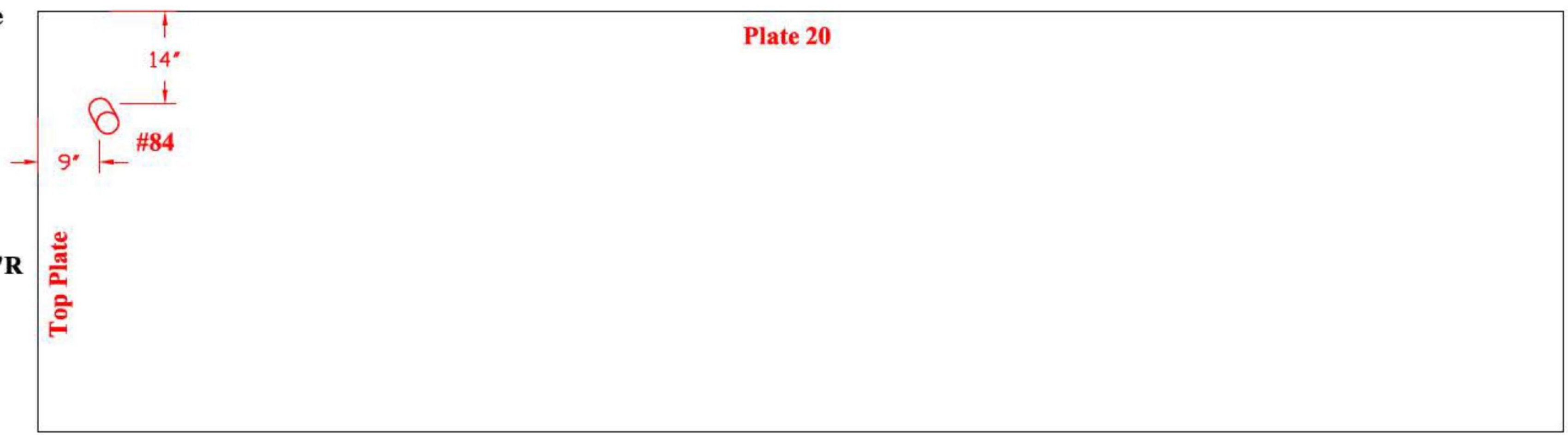


Tank Section: Lower Dome
Quadrant: B

Course: 2
Plate #: 20

Flaw # - Type - Remaining:

#84 - Grout Nozzle - 0.210"R



Drawing is not to scale

TANK # 20 - QUADRANT C

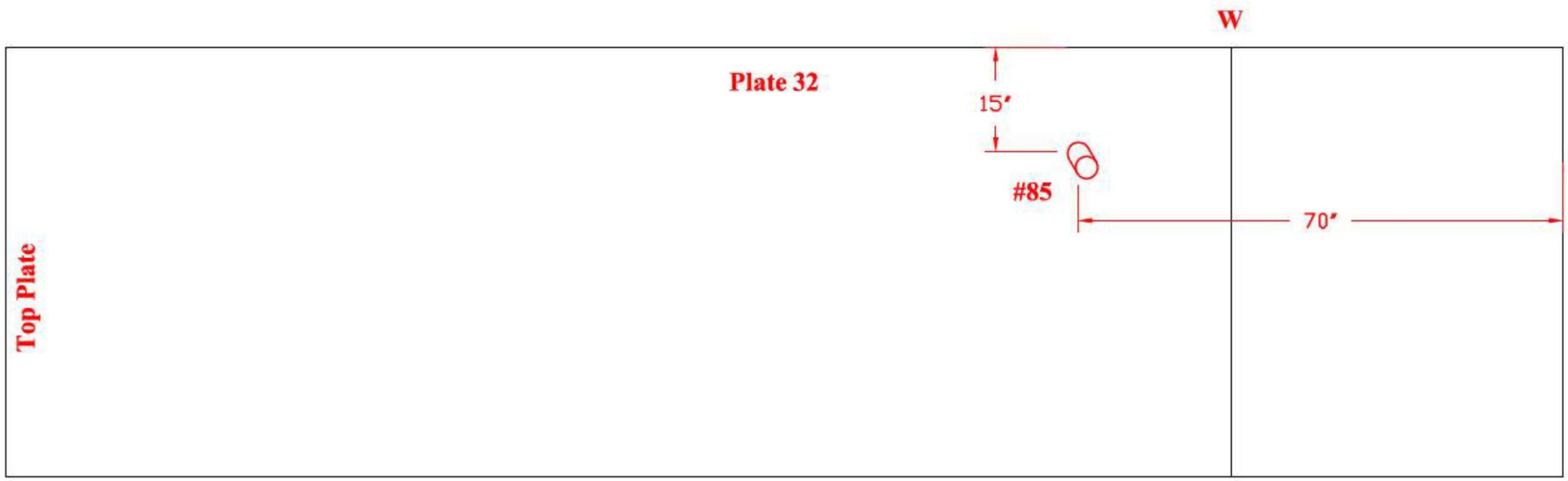
**Nominal Plate Thickness: 0.250"*

Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 32

Flaw # - Type - Remaining:

#85 - Grout Nozzle - 0.207"R

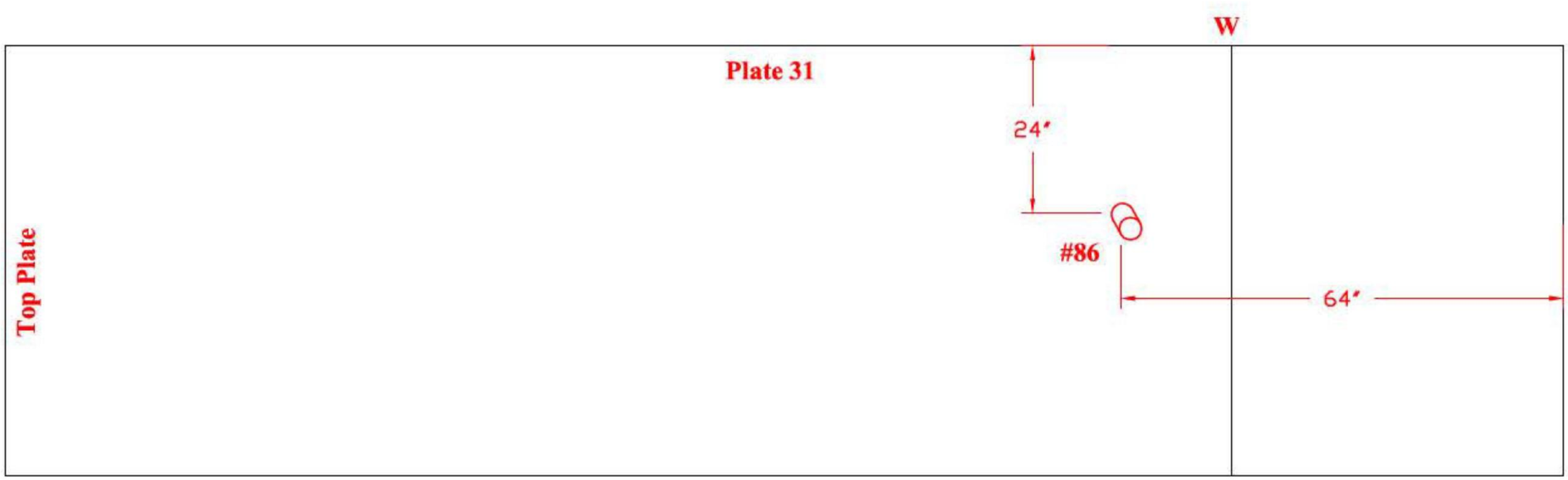


Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 31

Flaw # - Type - Remaining:

#86 - Grout Nozzle - 0.199"R



Drawing is not to scale

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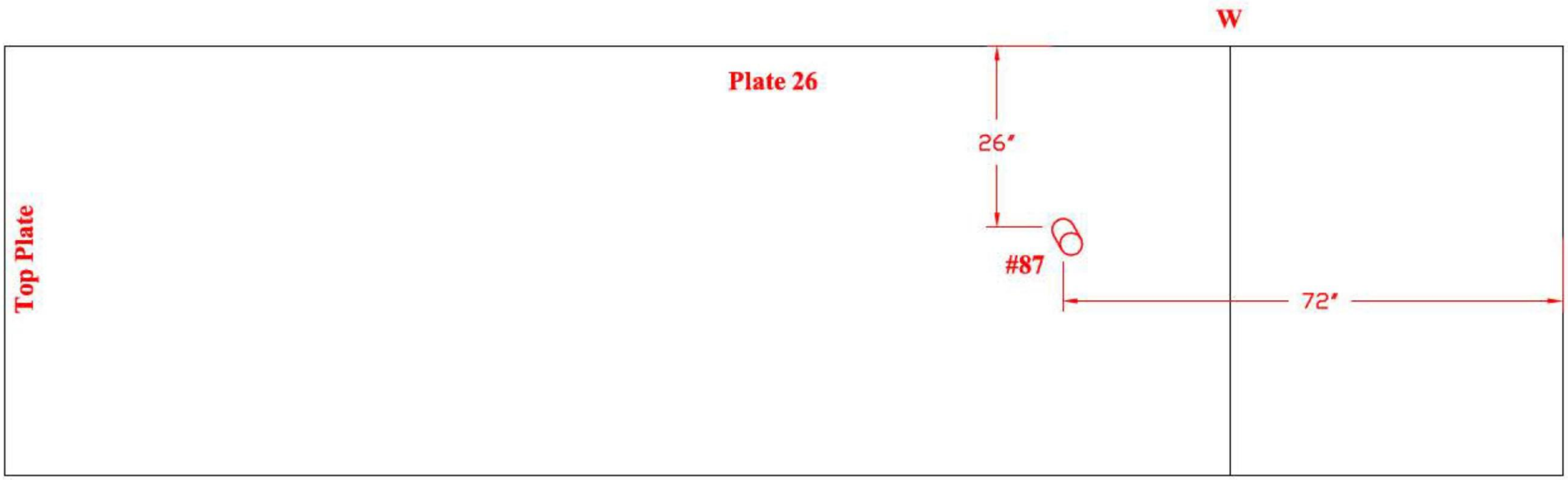
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 26

Flaw # - Type - Remaining:

#87 - Grout Nozzle - 0.216"R

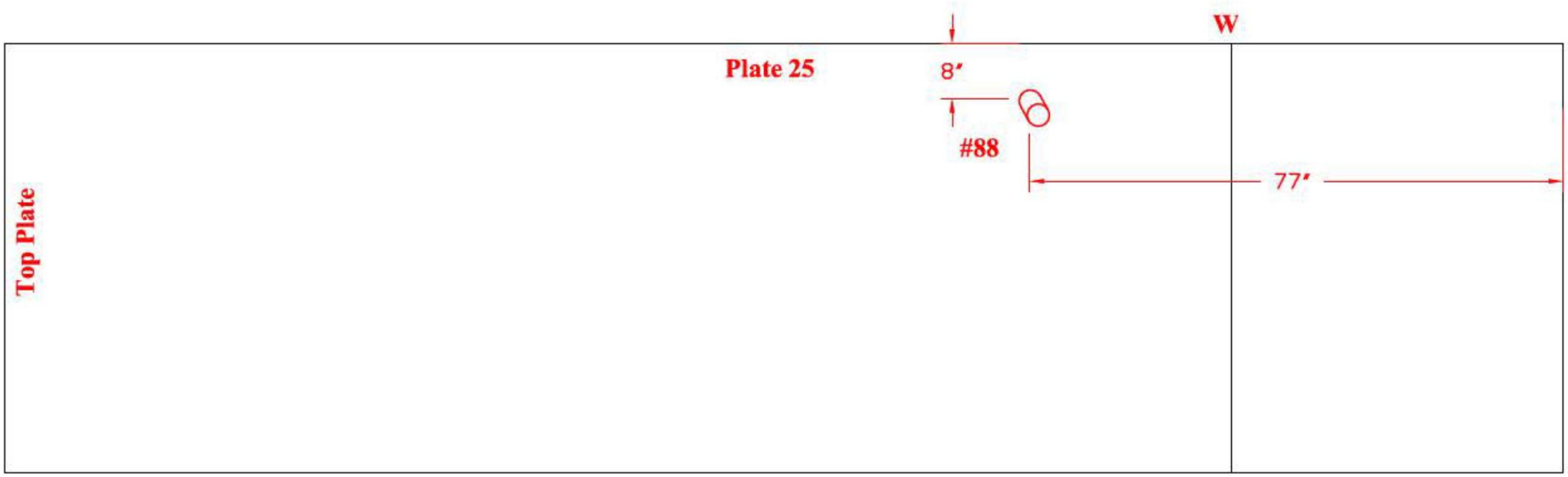


Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 25

Flaw # - Type - Remaining:

#88 - Grout Nozzle - 0.211"R



Drawing is not to scale

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TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

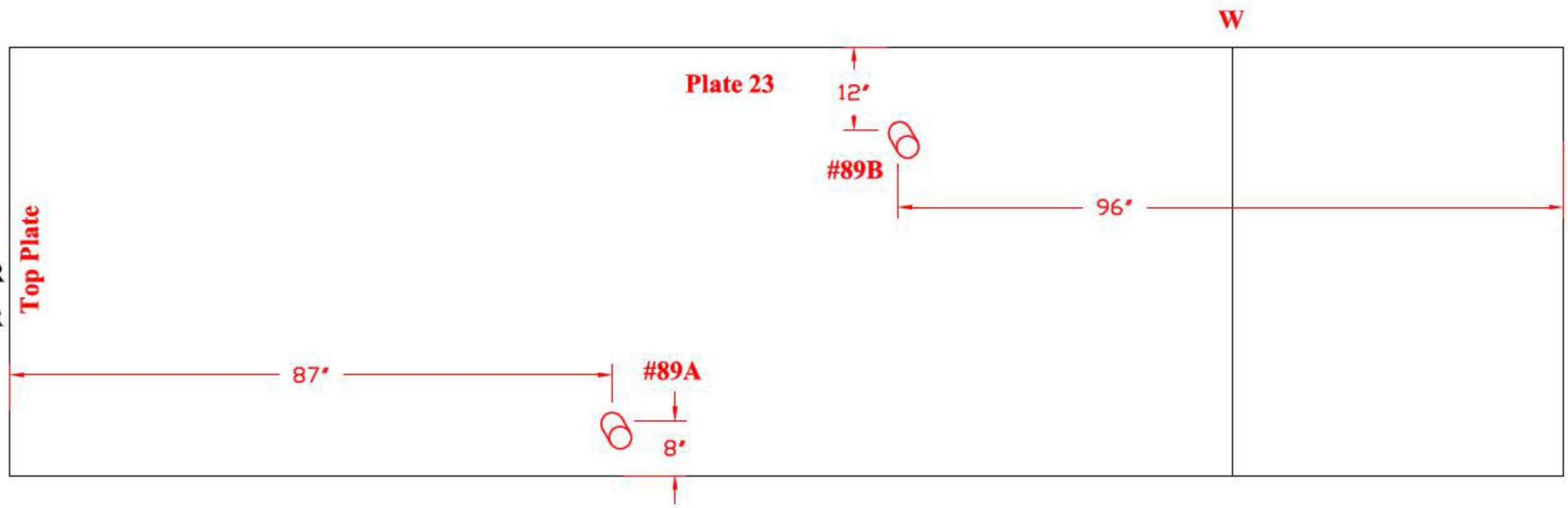
Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 23

Flaw # - Type - Remaining:

#89A - Grout Nozzle - 0.207"R

#89B - Grout Nozzle - 0.217"R

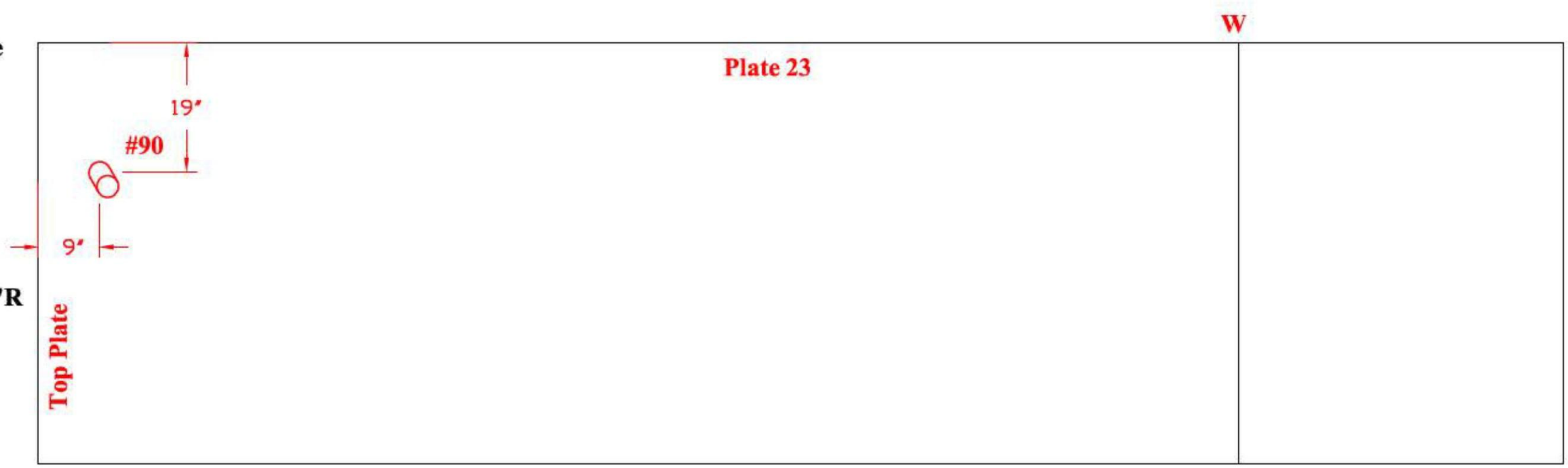


Tank Section: Lower Dome
Quadrant: C

Course: 2
Plate #: 23

Flaw # - Type - Remaining:

#90 - Grout Nozzle - 0.219"R



Drawing is not to scale

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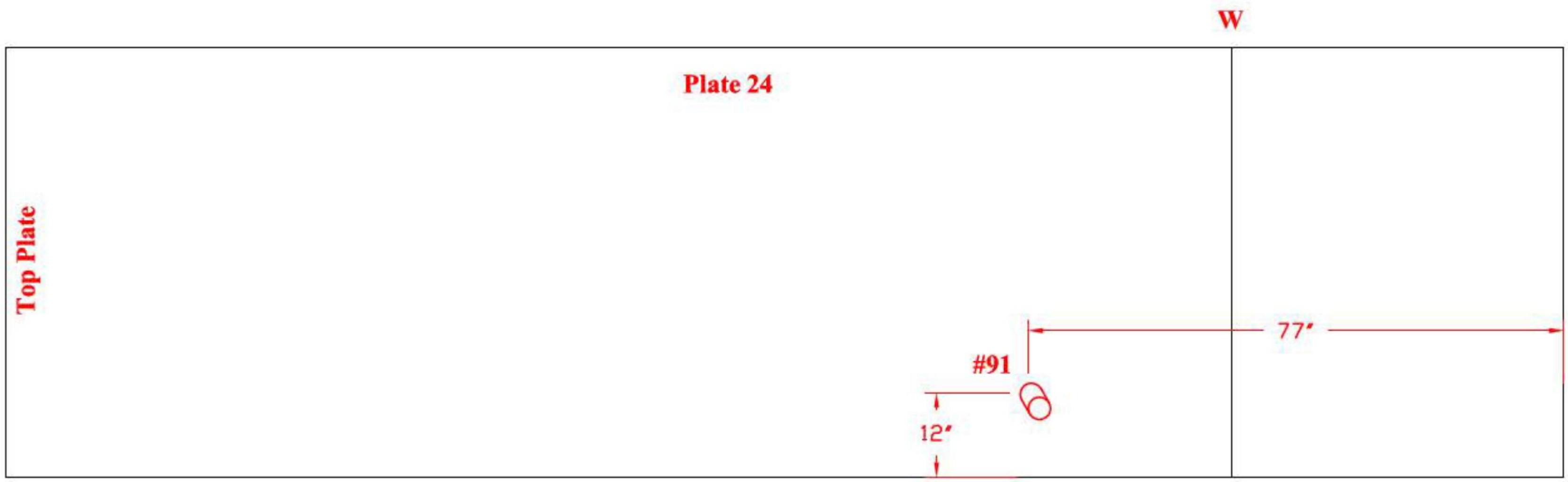
TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: C

Course: 2
Plate #: 24

Flaw # - Type - Remaining:

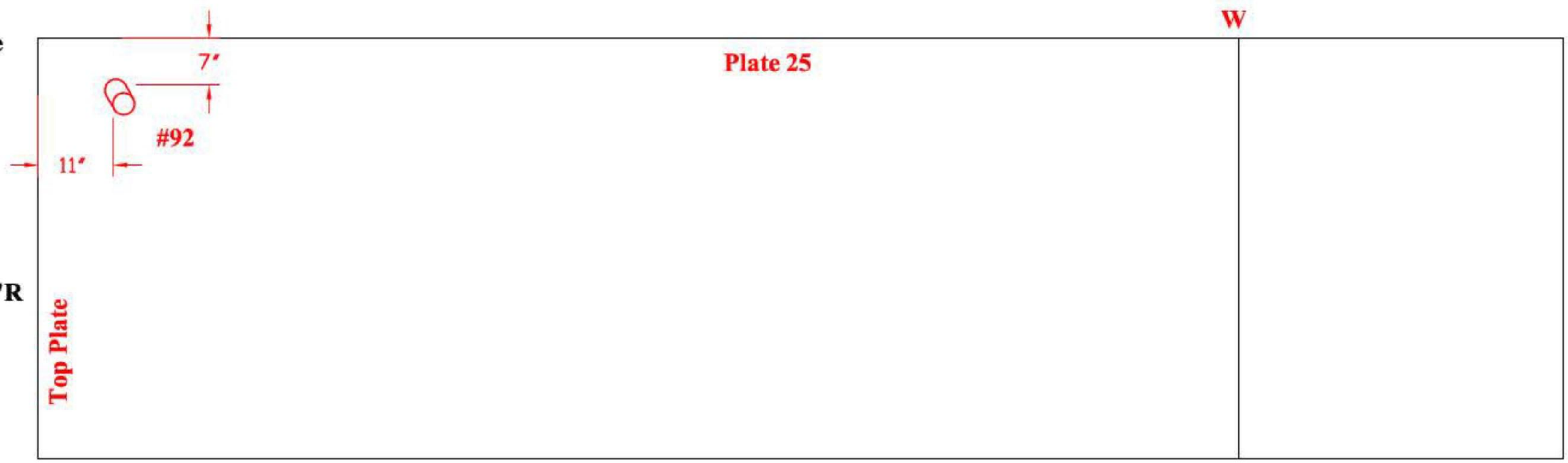
#91 - Grout Nozzle - 0.210"R



Tank Section: Lower Dome
Quadrant: C

Course: 2
Plate #: 25
Flaw # - Type - Remaining:

#92 - Grout Nozzle - 0.213"R



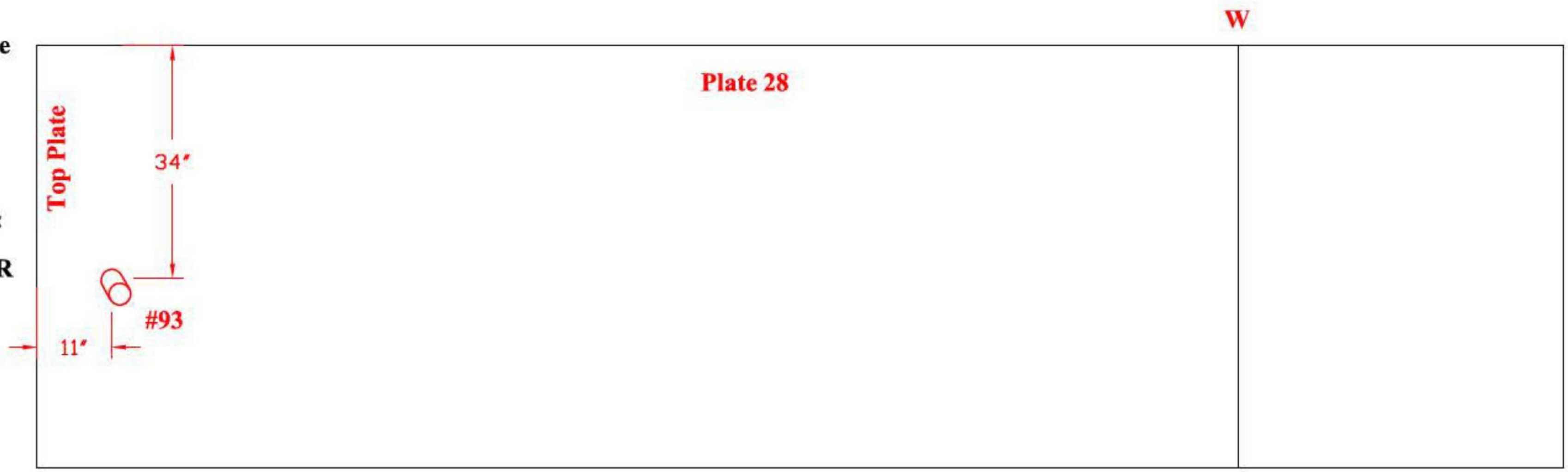
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 28

Flaw # - Type - Remaining:

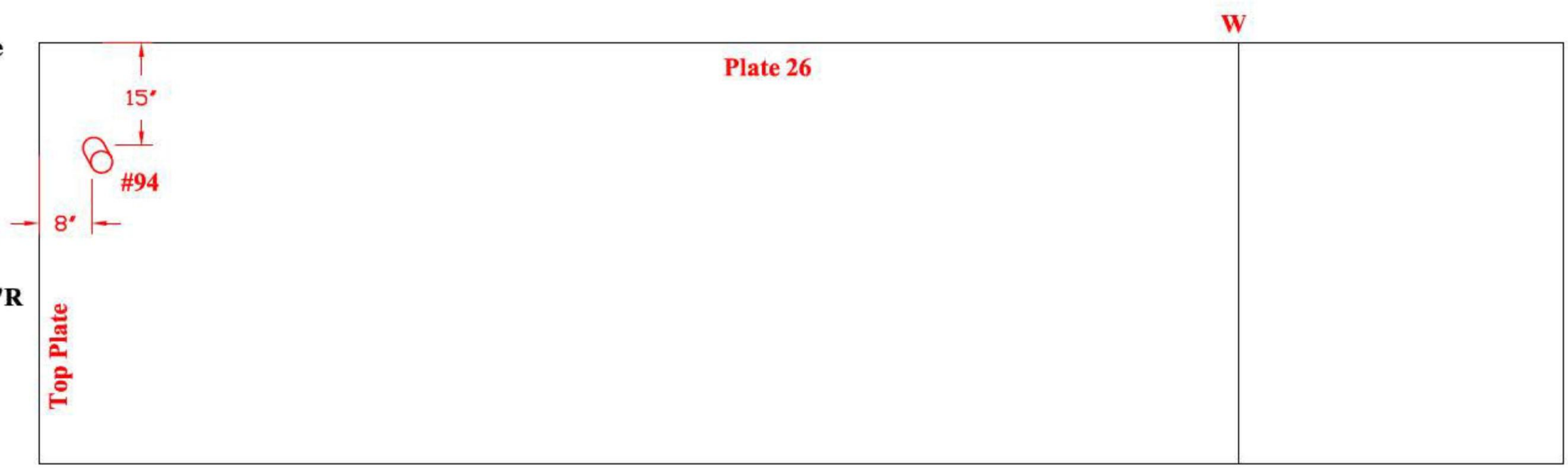
#93 - Grout Nozzle - 0.216"R



Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 26
Flaw # - Type - Remaining:

#94 - Grout Nozzle - 0.187"R



Drawing is not to scale

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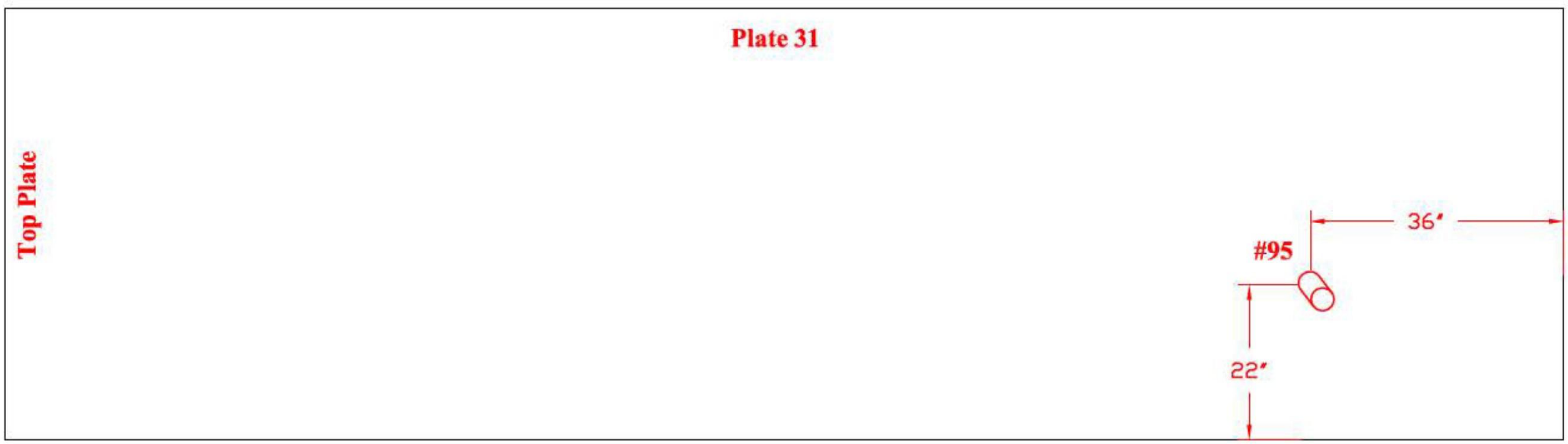
TANK # 20 - QUADRANT B
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: B

Course: 4
Plate #: 31

Flaw # - Type - Remaining:

#95 - Grout Nozzle - 0.215"R

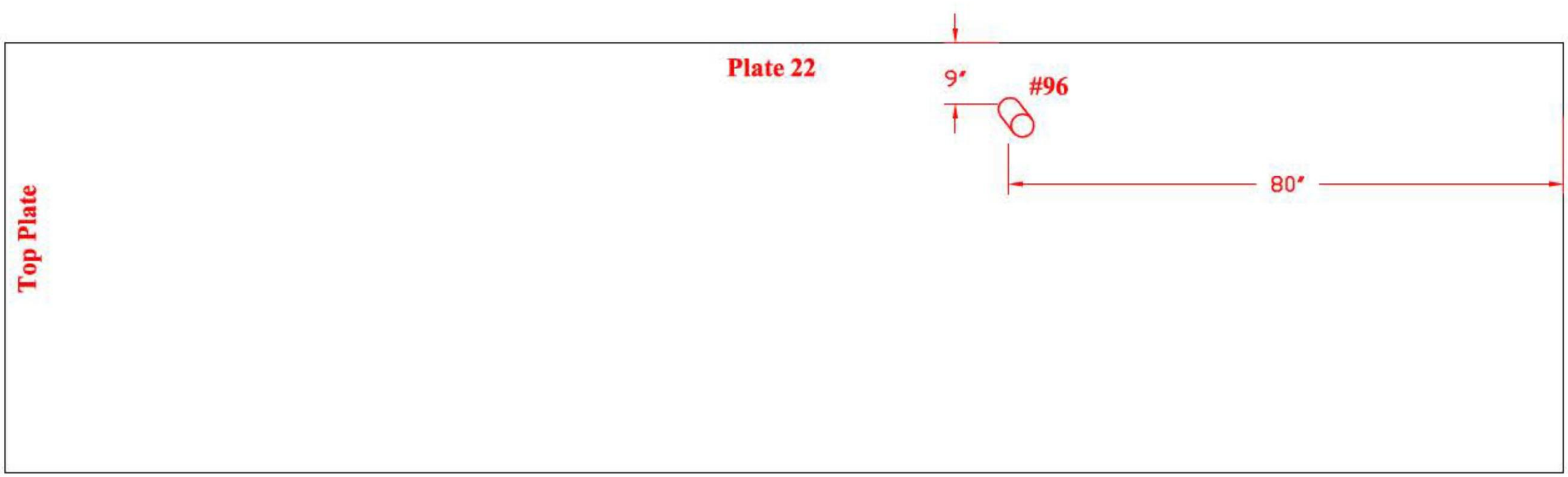


Tank Section: Lower Dome
Quadrant: B

Course: 3
Plate #: 22

Flaw # - Type - Remaining:

#96 - Grout Nozzle - 0.230"R



Drawing is not to scale

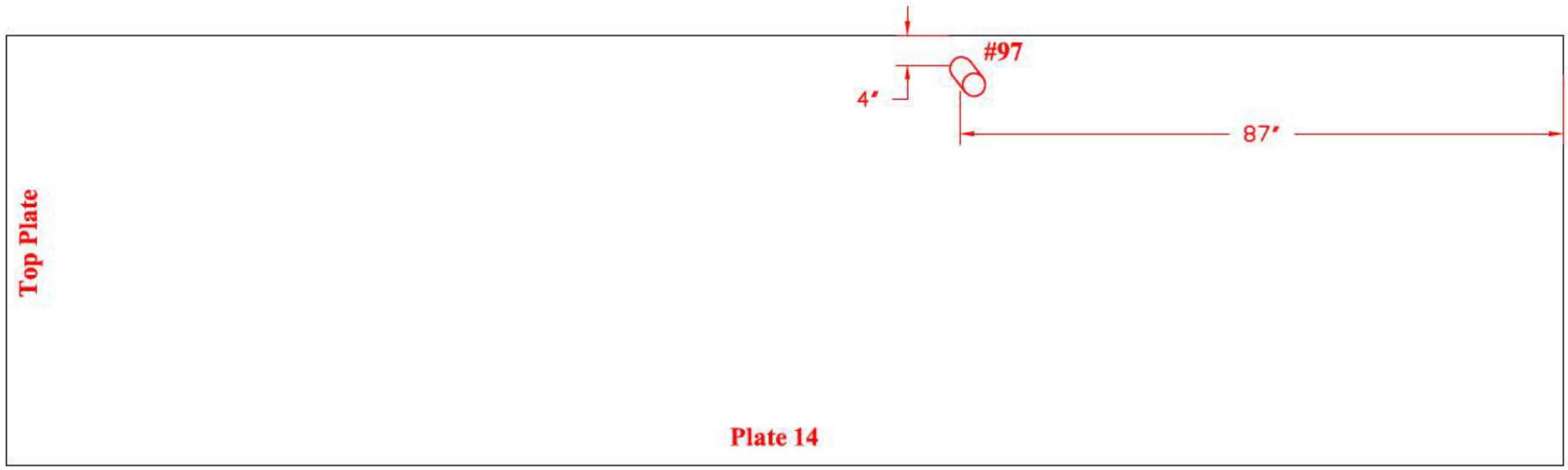
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: B

Course: 3
Plate #: 14

Flaw # - Type - Remaining:

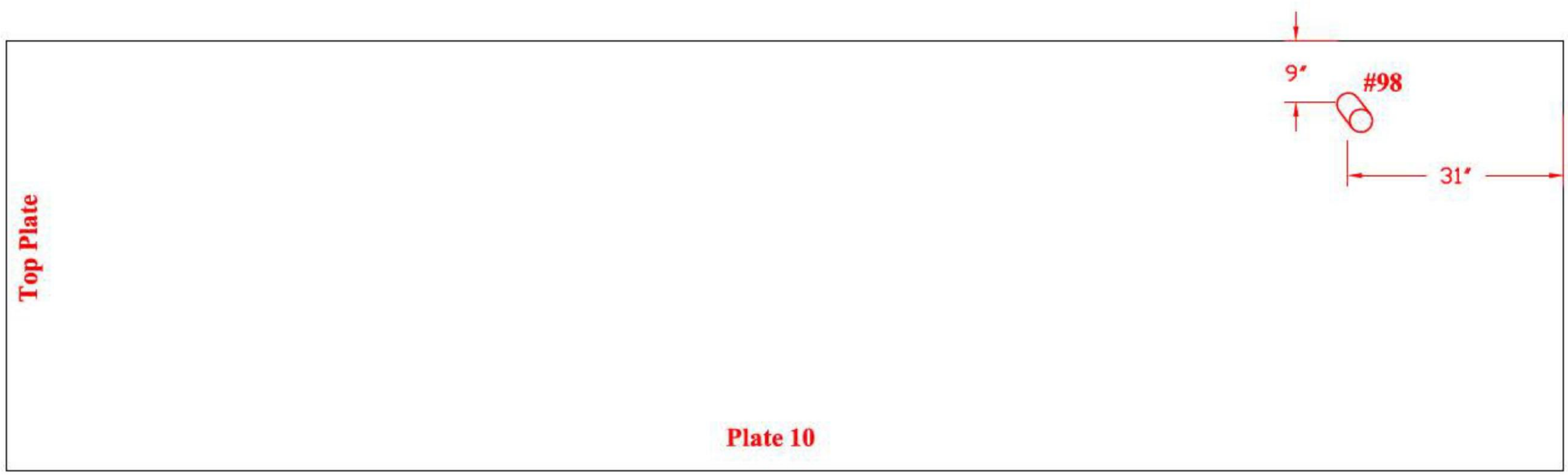
#97 - Grout Nozzle - 0.220"R



Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 10
Flaw # - Type - Remaining:

#98 - Grout Nozzle - 0.219"R



Drawing is not to scale

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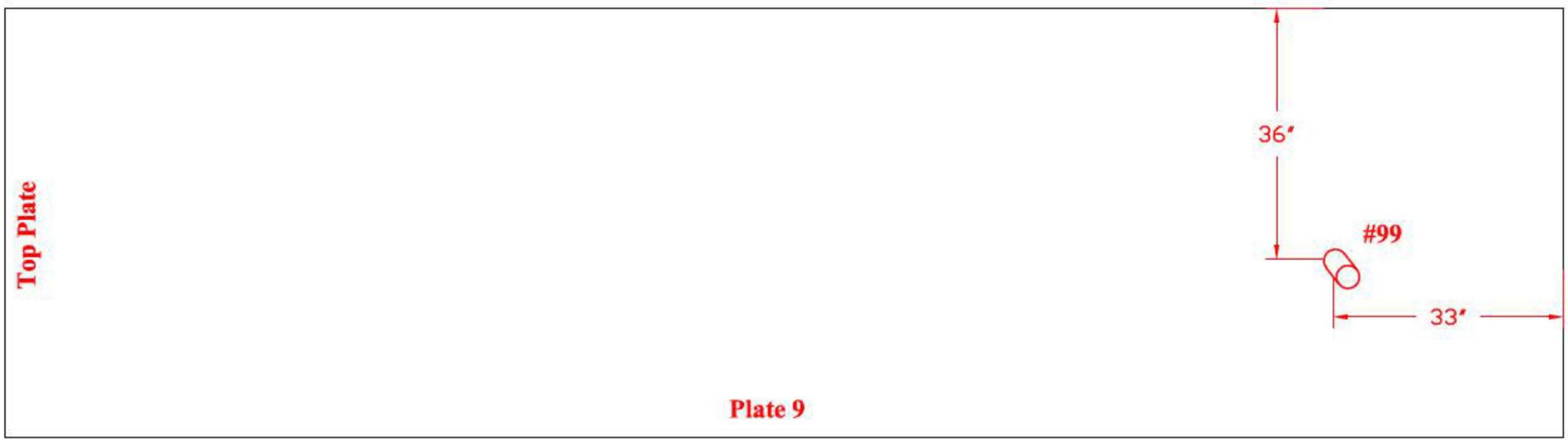
TANK # 20 - QUADRANT A
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 9

Flaw # - Type - Remaining:

#99 - Grout Nozzle - 0.198"R

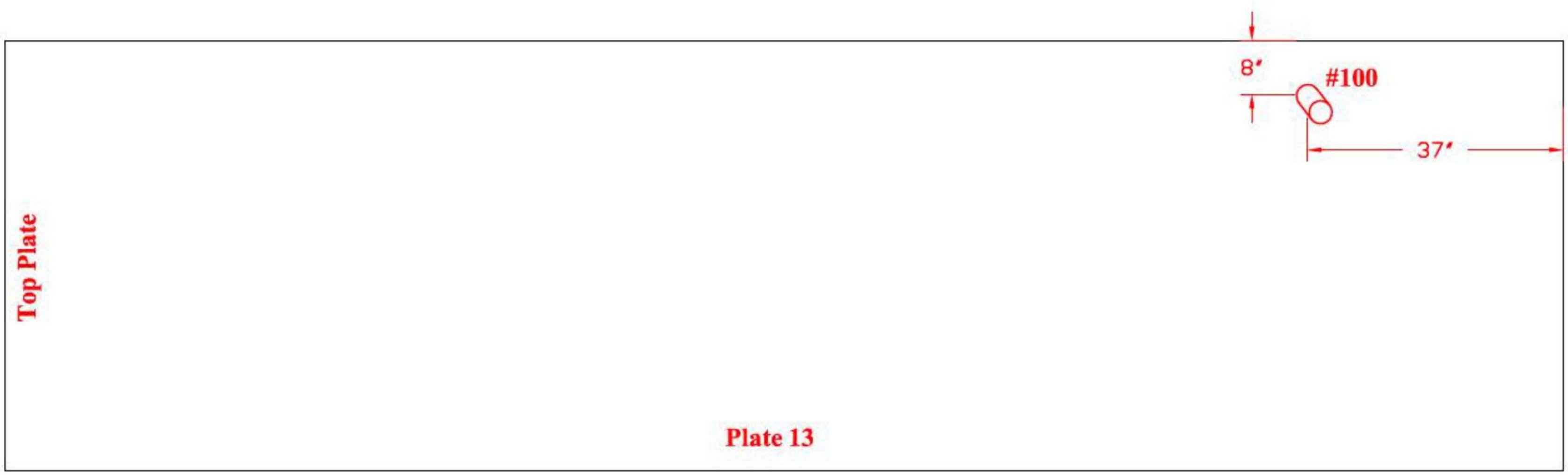


Tank Section: Lower Dome
Quadrant: A

Course: 4
Plate #: 13

Flaw # - Type - Remaining:

#100 - Grout Nozzle - 0.219"R



Drawing is not to scale

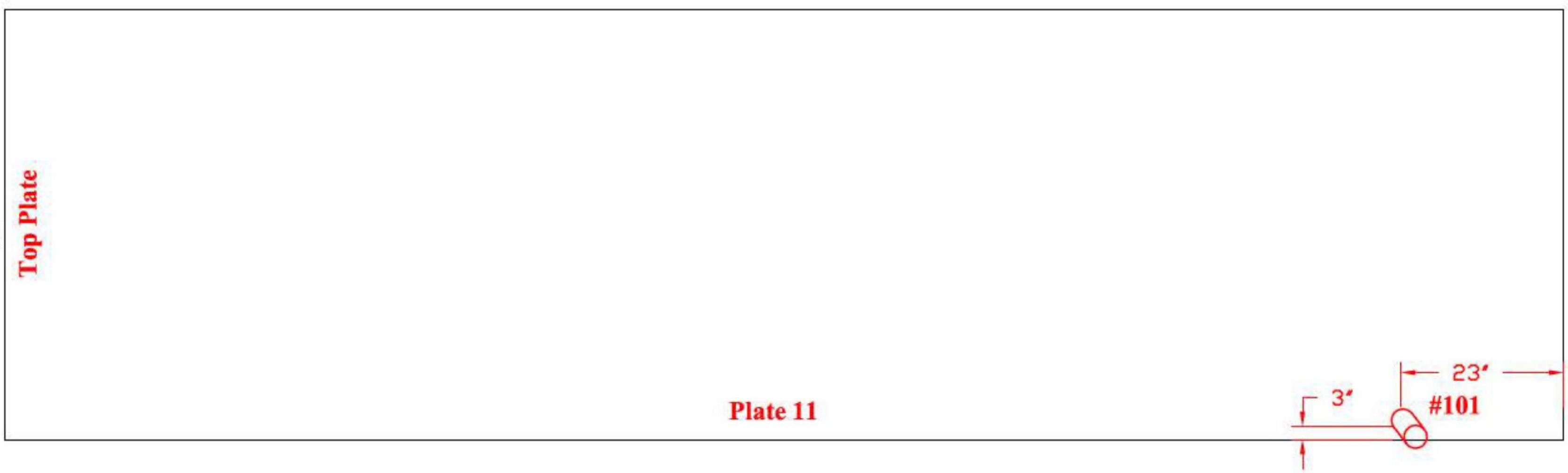
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 4
Plate #: 11

Flaw # - Type - Remaining:

#101 - Grout Nozzle - 0.222"R

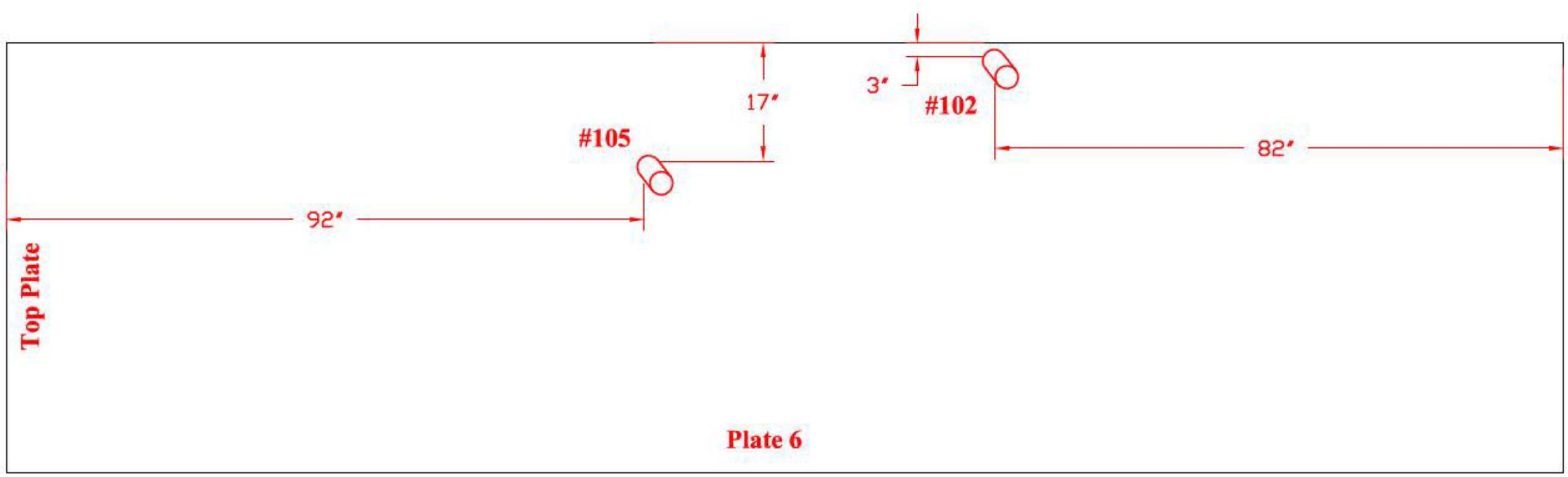


Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 6

Flaw # - Type - Remaining:

#102 - Grout Nozzle - 0.223"R
#105 - Grout Nozzle - 0.213"R



Drawing is not to scale

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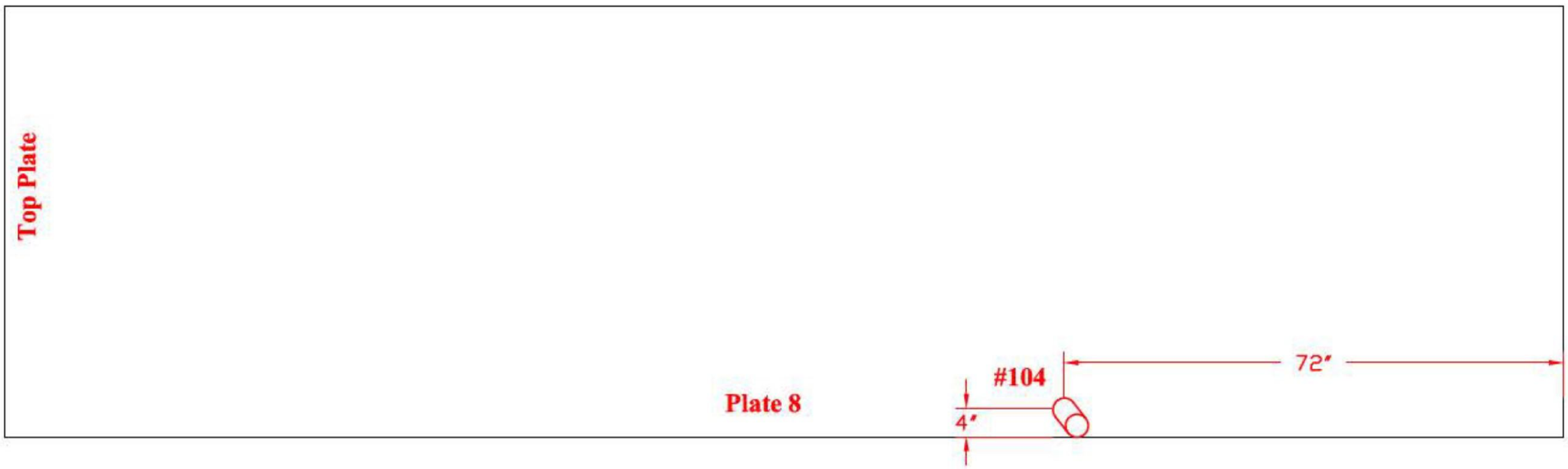
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 8

Flaw # - Type - Remaining:

#104 - Grout Nozzle - 0.230"R



Drawing is not to scale

TesTex
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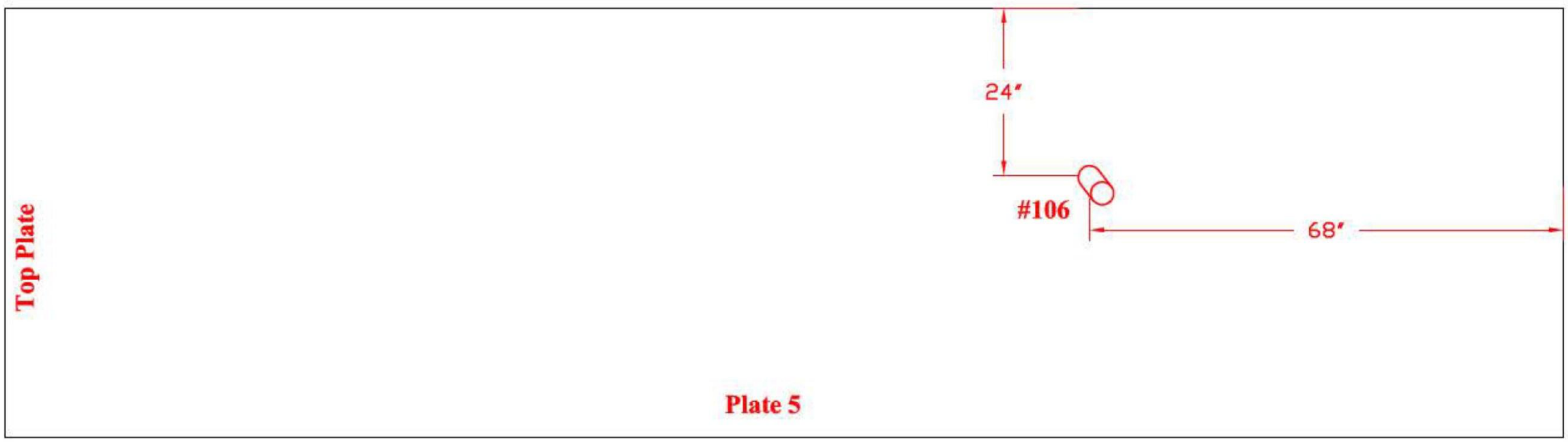
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 6

Flaw # - Type - Remaining:
#106 - Grout Nozzle - 0.222"R



Drawing is not to scale

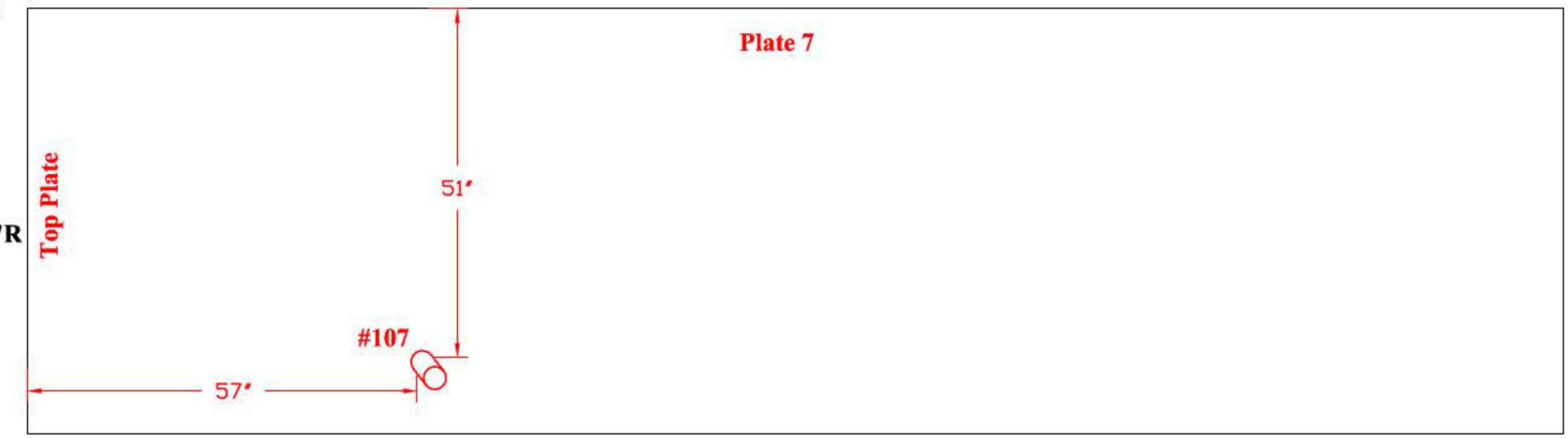
TANK # 20 - QUADRANT A
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: A

Course: 4
Plate #: 7

Flaw # - Type - Remaining:

#107 - Grout Nozzle - 0.214"R

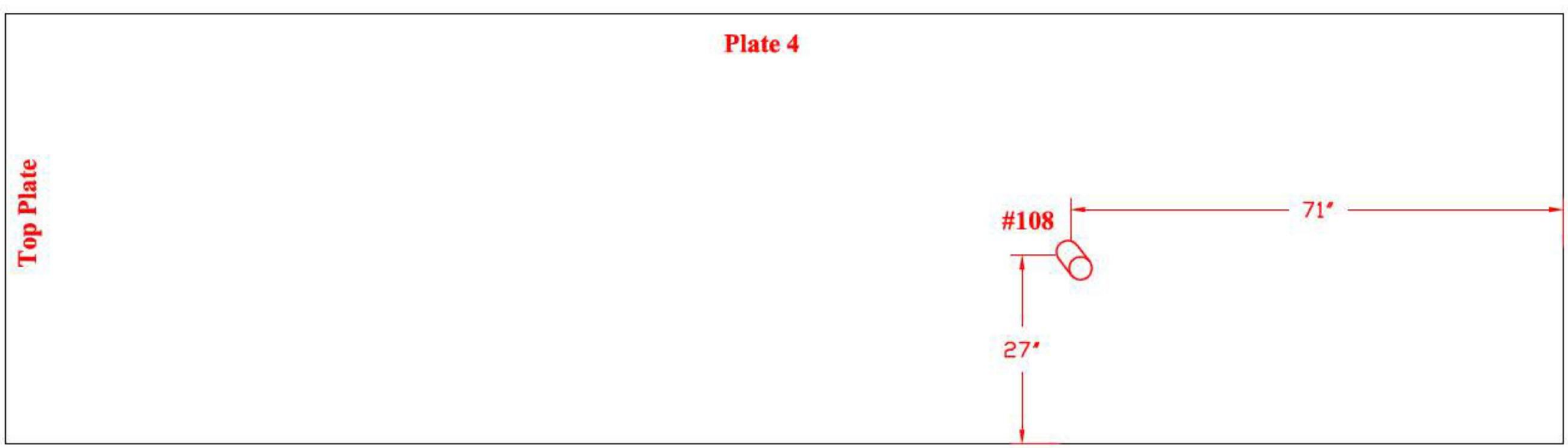


Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 4

Flaw # - Type - Remaining:

#108 - Grout Nozzle - 0.215"R



Drawing is not to scale

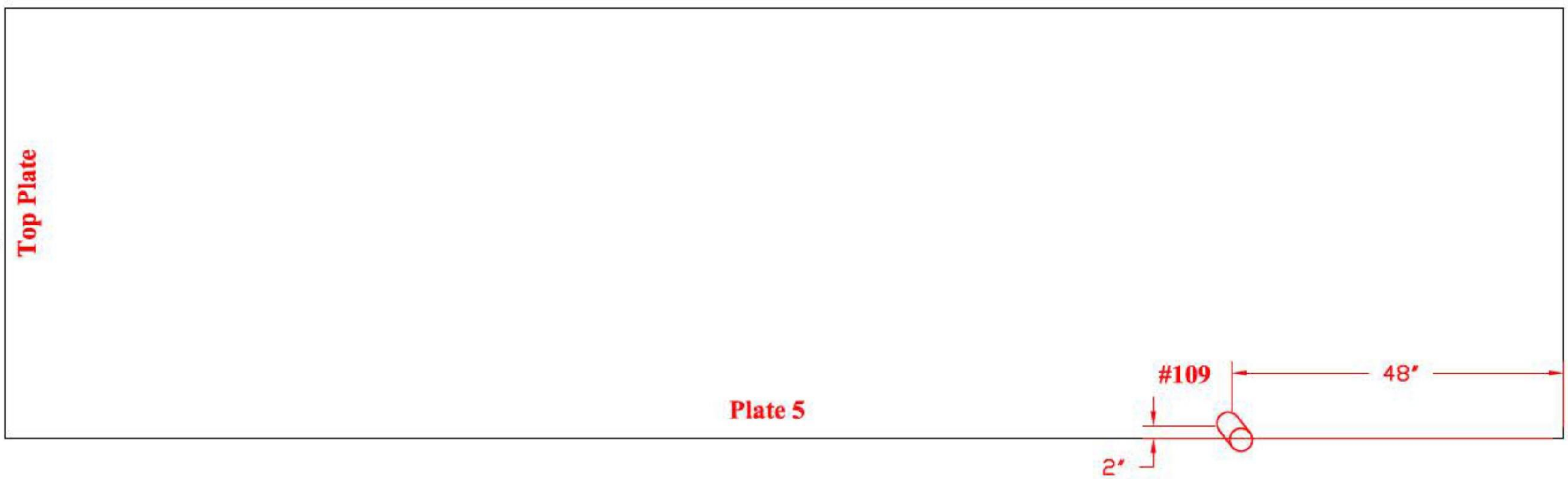
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 3

Flaw # - Type - Remaining:

#109 - Grout Nozzle - 0.224"R

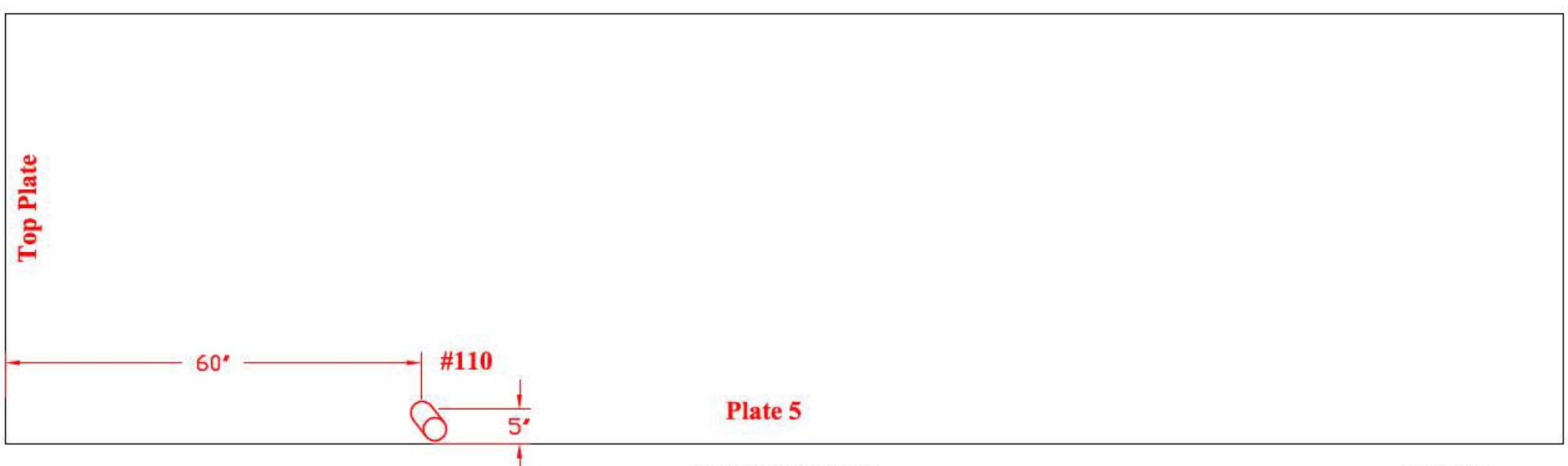


Tank Section: Lower Dome
Quadrant: A

Course: 4
Plate #: 5

Flaw # - Type - Remaining:

#110 - Grout Nozzle - 0.220"R



Drawing is not to scale

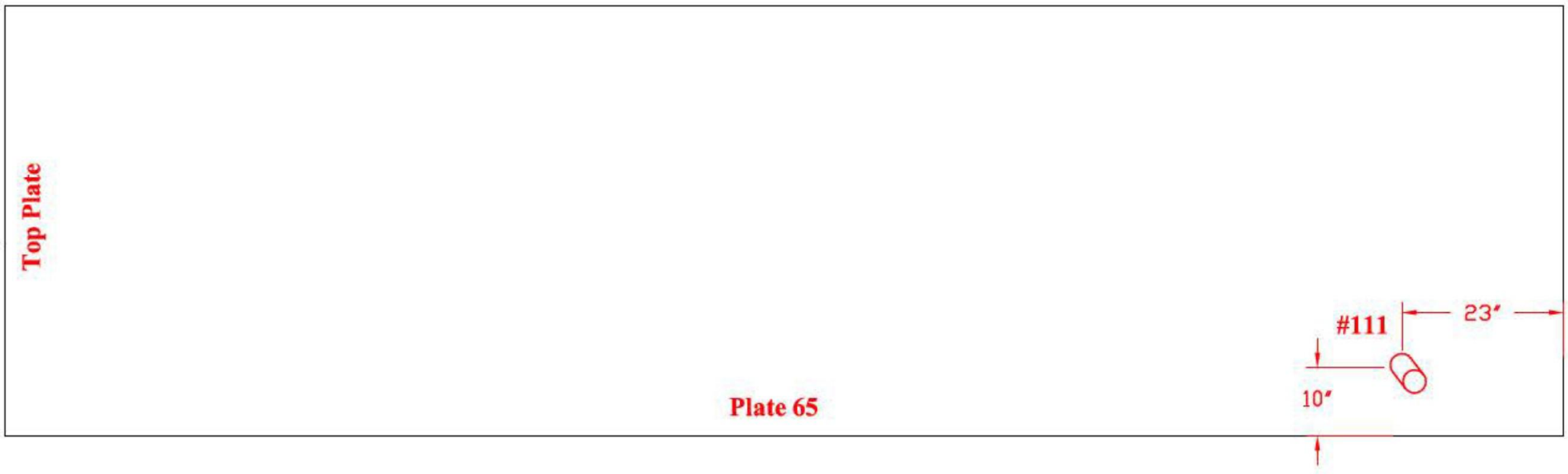
TANK # 20 - QUADRANT D

Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 4
Plate #: 65
Flaw # - Type - Remaining:

#111 - Grout Nozzle - 0.228"R

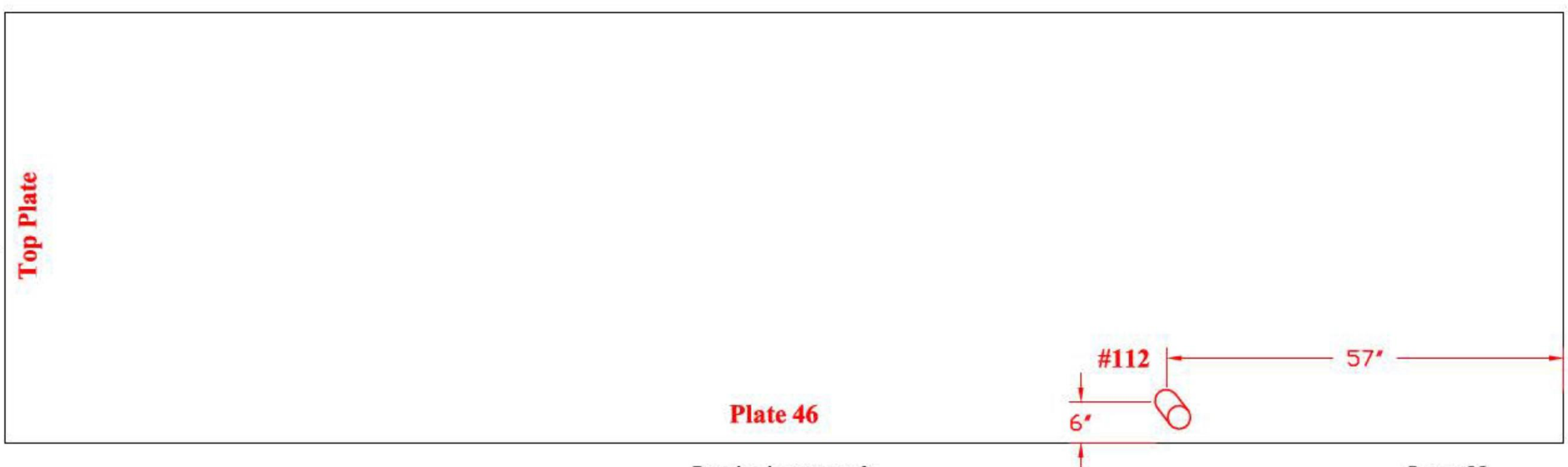


Tank Section: Lower Dome
Quadrant: D

Course: 4
Plate #: 46

Flaw # - Type - Remaining:

#112 - Grout Nozzle - 0.201"R



Drawing is not to scale

TANK # 20 - QUADRANT B AND C

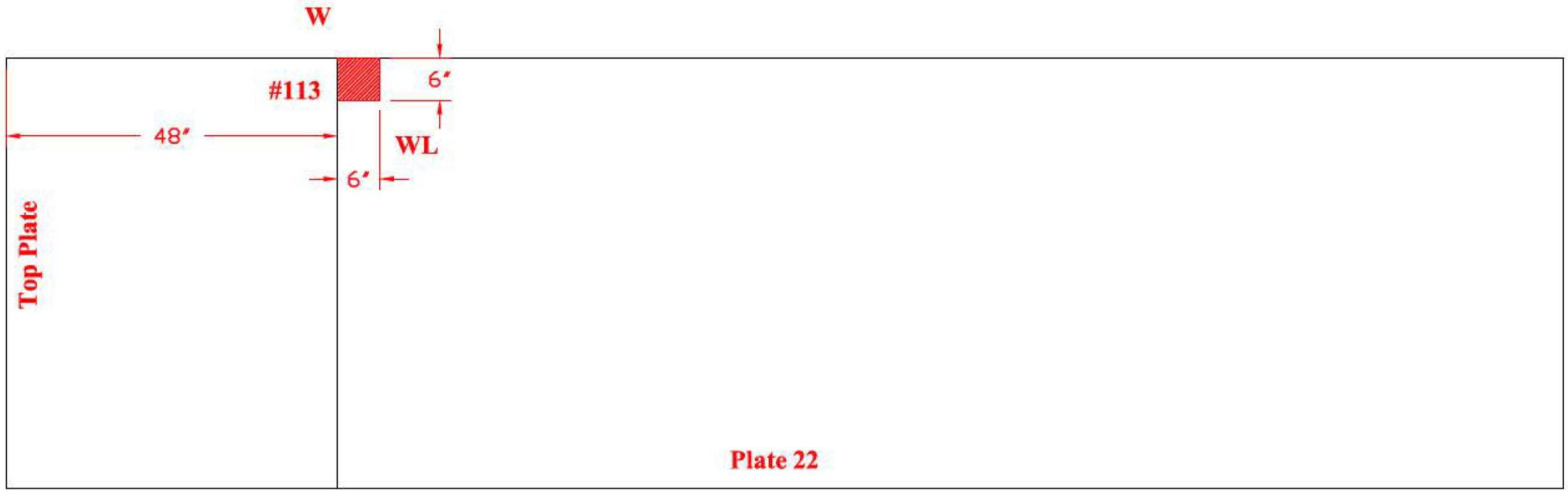
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: B

Course: 3
Plate #: 22

Flaw # - Type - Remaining:

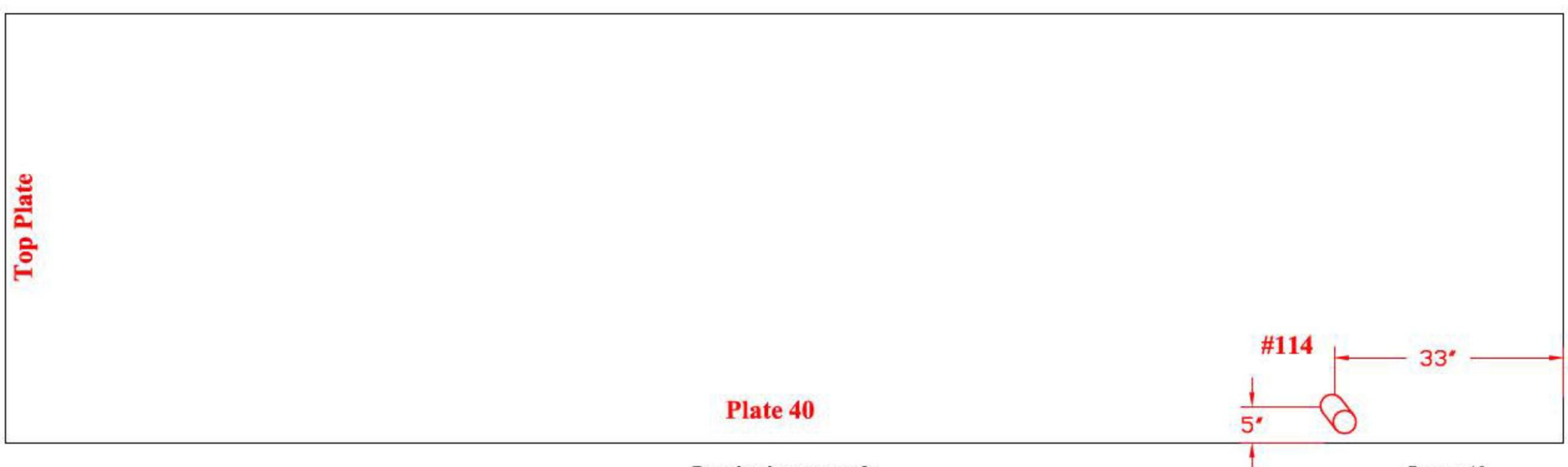
#113 - Wall Loss - 0.232"R



Tank Section: Lower Dome
Quadrant: C

Course: 4
Plate #: 40
Flaw # - Type - Remaining:

#114 - Grout Nozzle - 0.212"R



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TANK # 20 - QUADRANT C

Nominal Plate Thickness: 0.250"

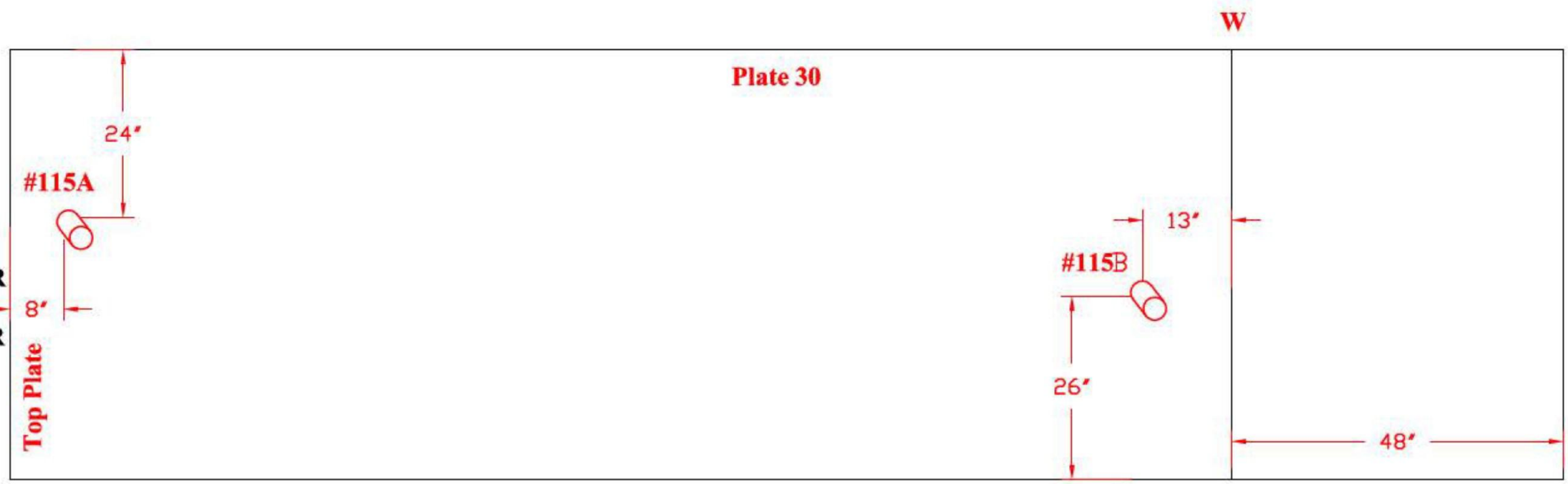
Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 30

Flaw # - Type - Remaining:

#115A - Grout Nozzle - 0.228"R

#115B - Grout Nozzle - 0.207"R

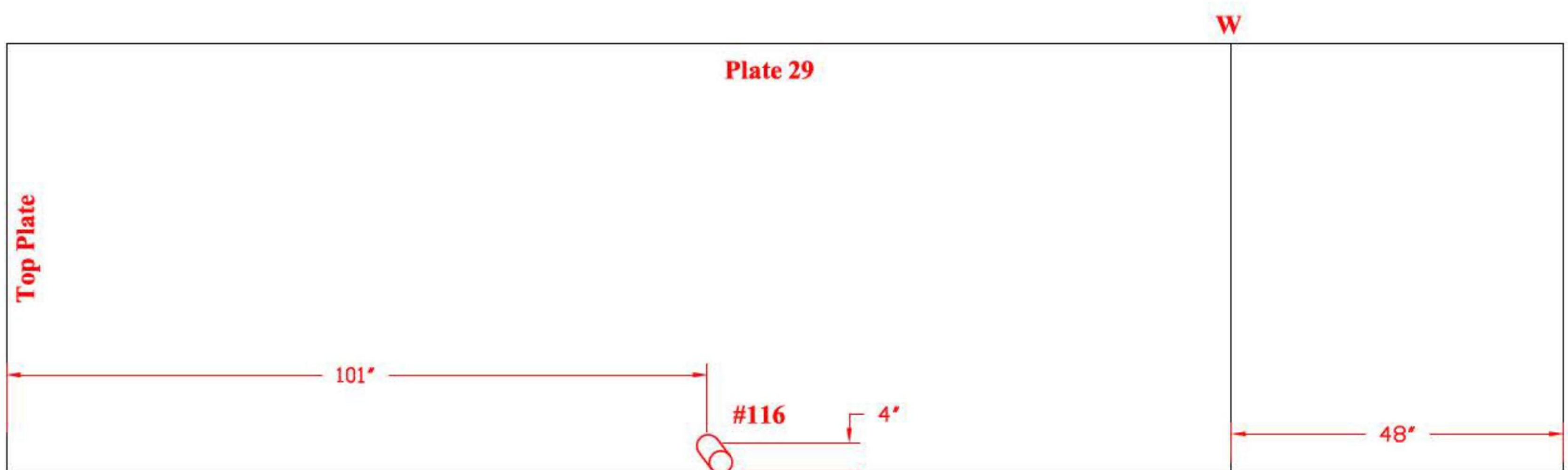


Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 29

Flaw # - Type - Remaining:

#116 - Grout Nozzle - 0.210"R



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TANK # 20 - QUADRANT C

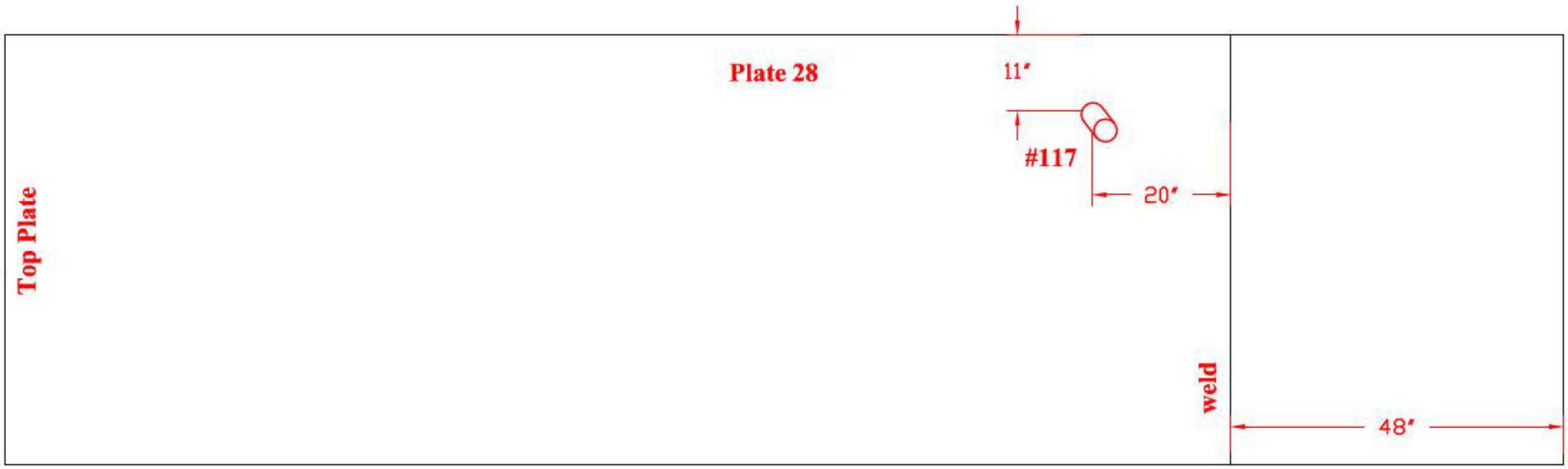
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 28

Flaw # - Type - Remaining:

#117 - Grout Nozzle - 0.216"R



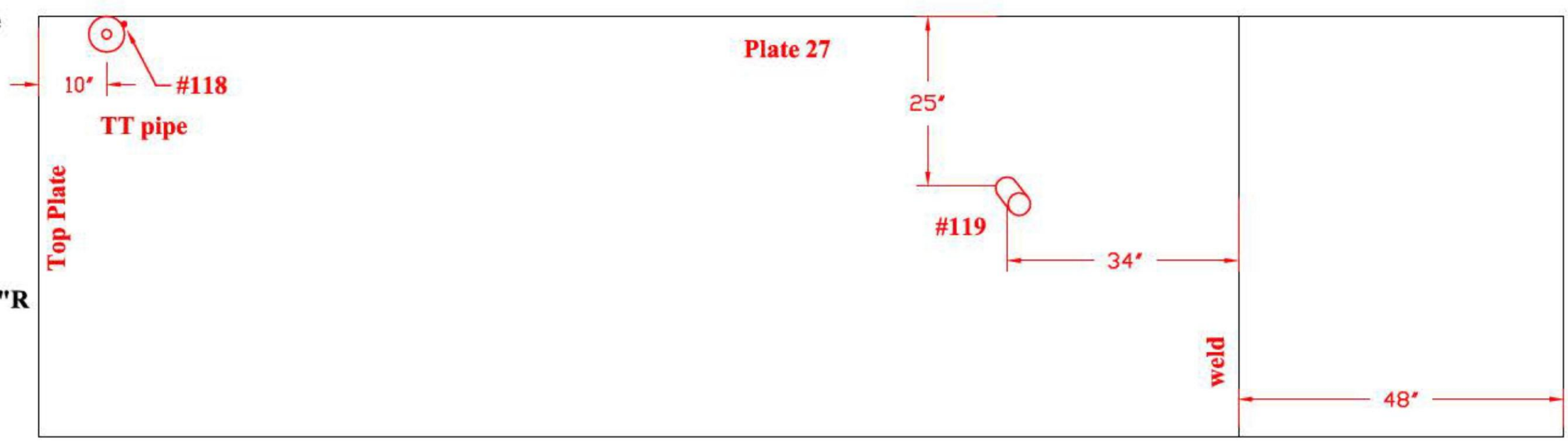
Tank Section: Lower Dome
Quadrant: C

Course: 3
Plate #: 27

Flaw # - Type - Remaining:

#118 - Pitting - 0.233"R

#119 - Grout Nozzle - 0.205"R



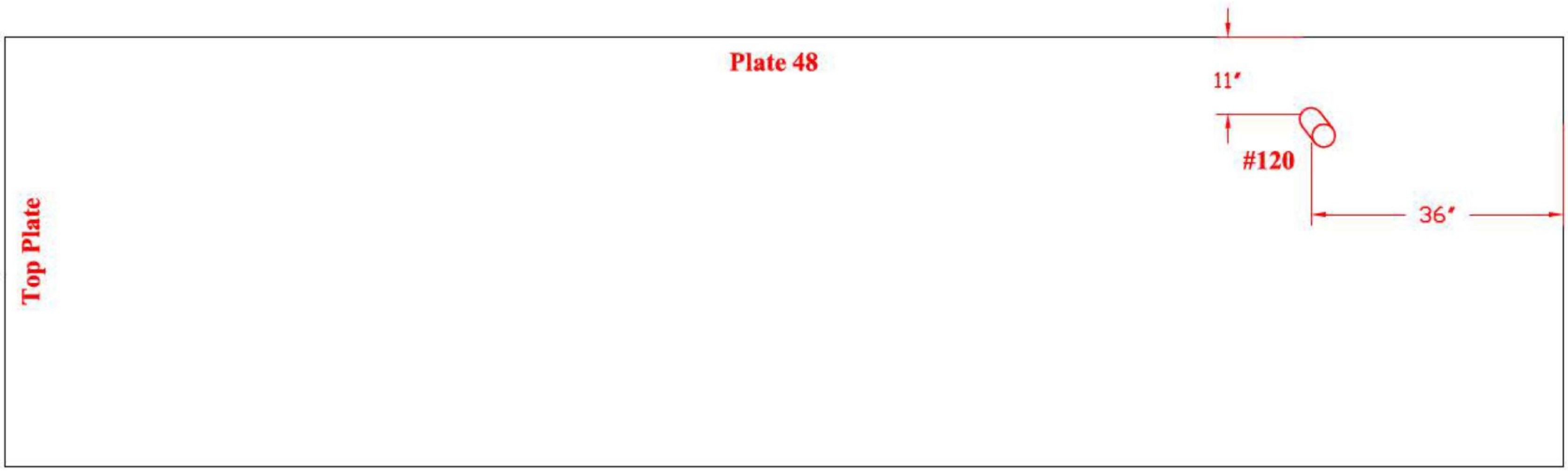
Drawing is not to scale

TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: C

Course: 4
Plate #: 48
Flaw # - Type - Remaining:

#120 - Grout Nozzle - 0.211"R

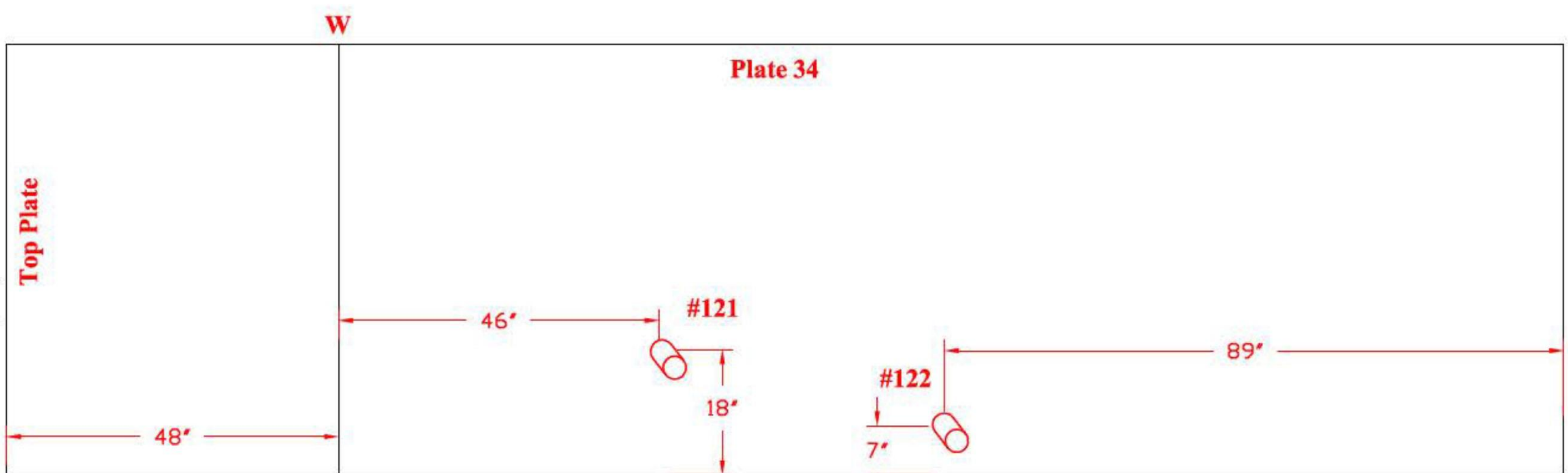


Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 34

Flaw # - Type - Remaining:

#121 - Grout Nozzle - 0.200"R
#122 - Grout Nozzle - 0.215"R



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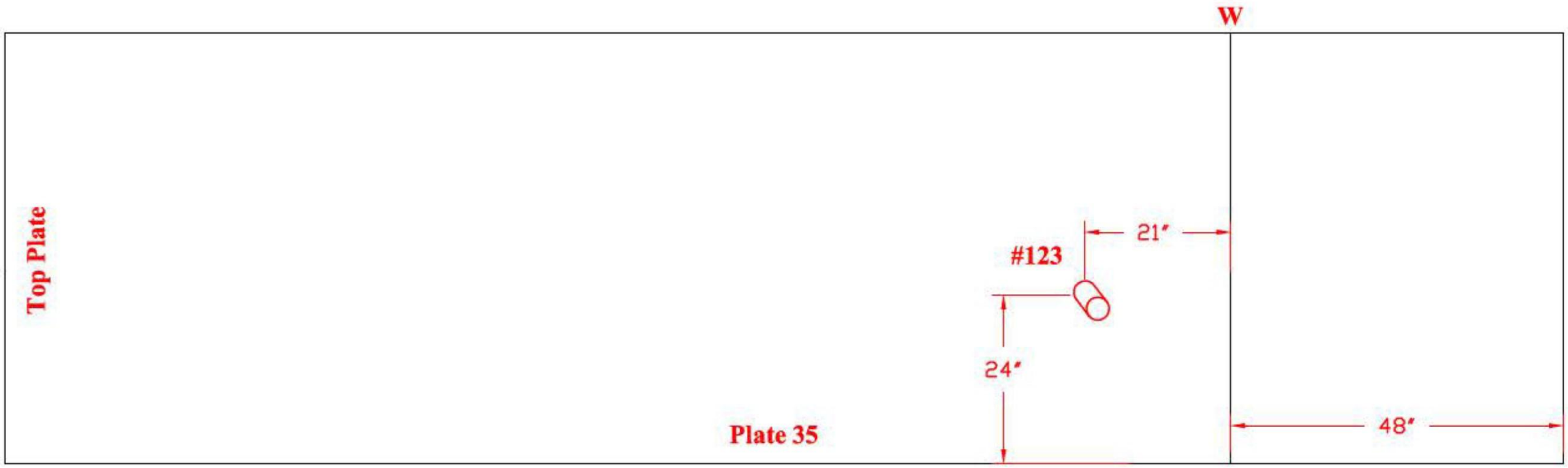
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 35

Flaw # - Type - Remaining:

#123 - Grout Nozzle - 0.200"R

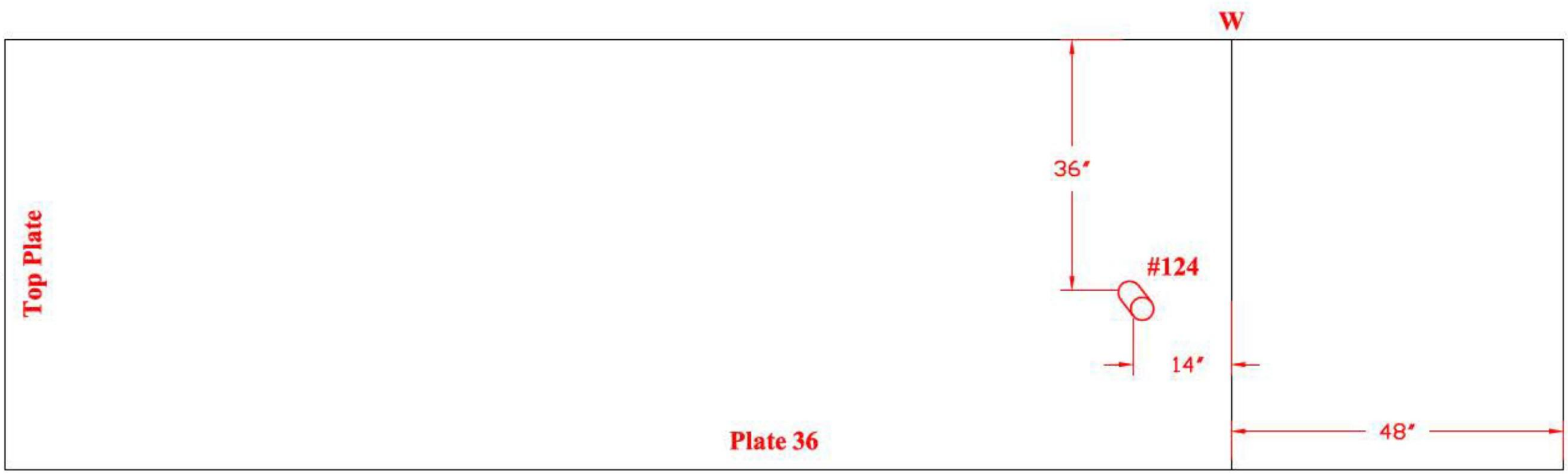


Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 36

Flaw # - Type - Remaining:

#124 - Grout Nozzle - 0.219"R



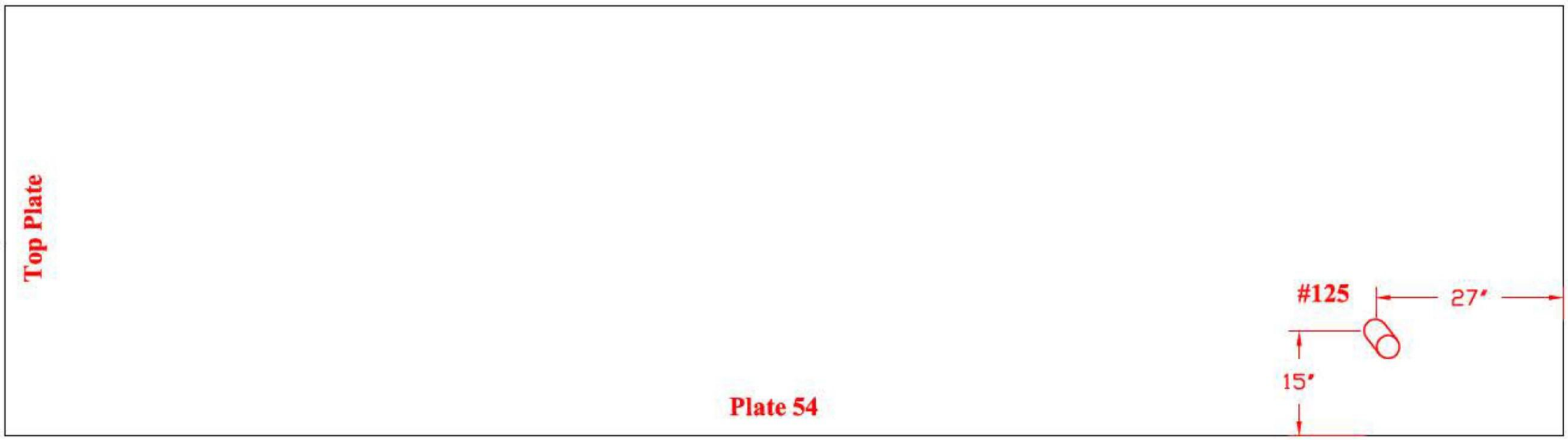
Drawing is not to scale

TANK # 20 - QUADRANT D
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: D

Course: 4
Plate #: 54
Flaw # - Type - Remaining:

#125 - Grout Nozzle - 0.212"R

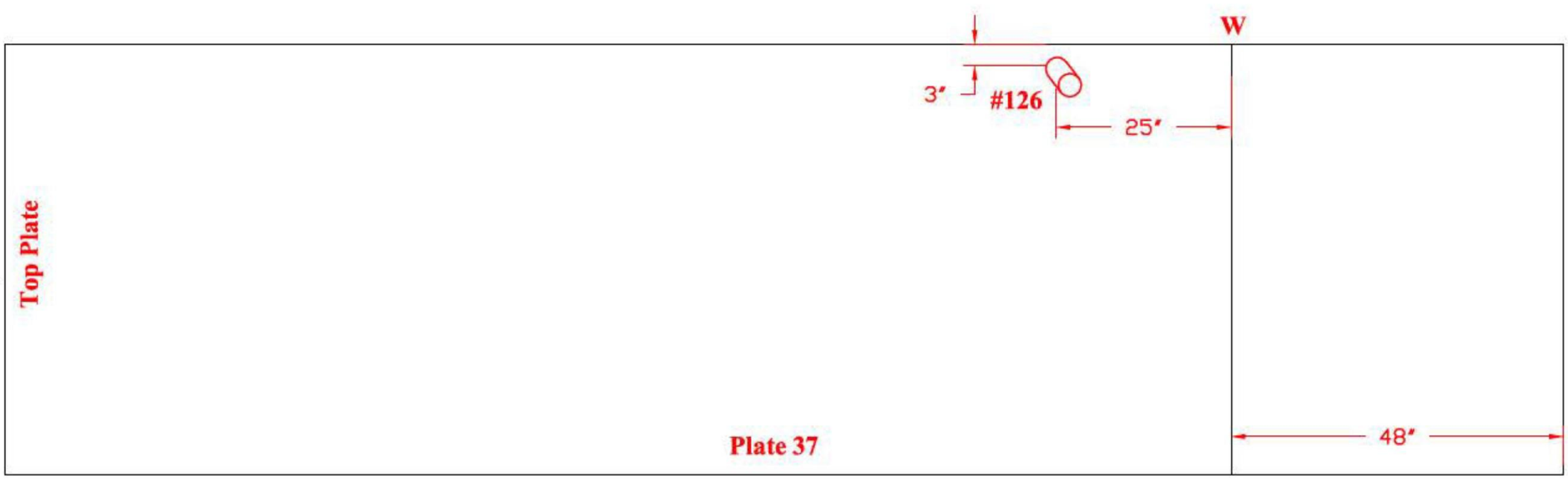


Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 37

Flaw # - Type - Remaining:

#126 - Grout Nozzle - 0.213"R



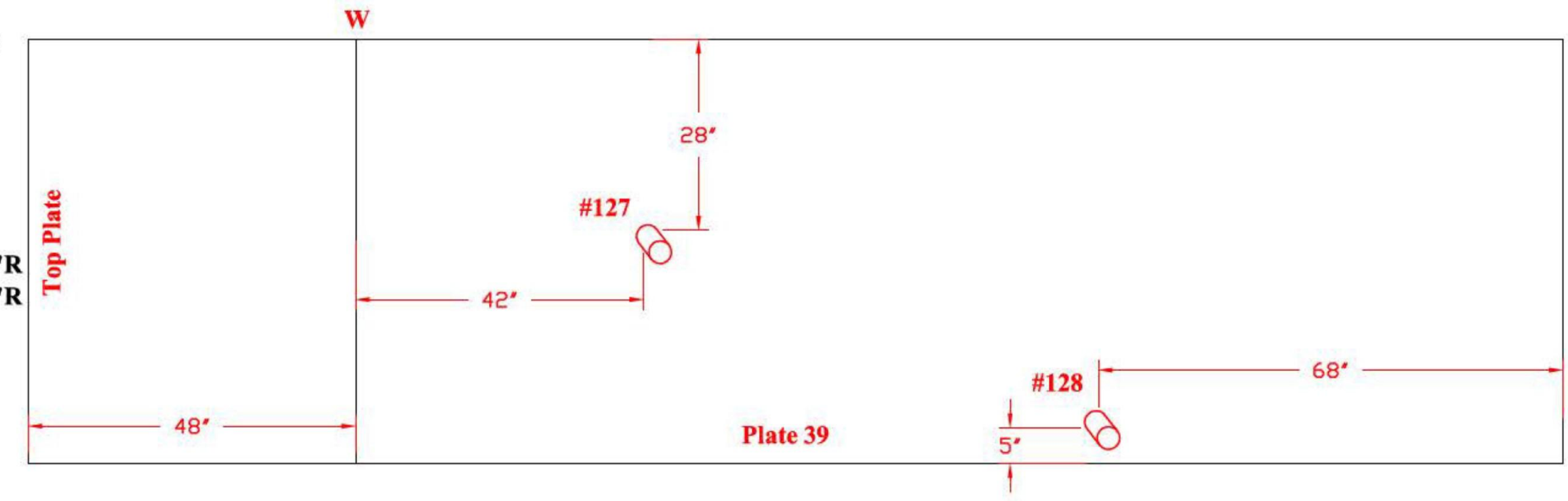
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 39
Flaw # - Type - Remaining:

#127 - Grout Nozzle - 0.204"R
#128 - Grout Nozzle - 0.212"R

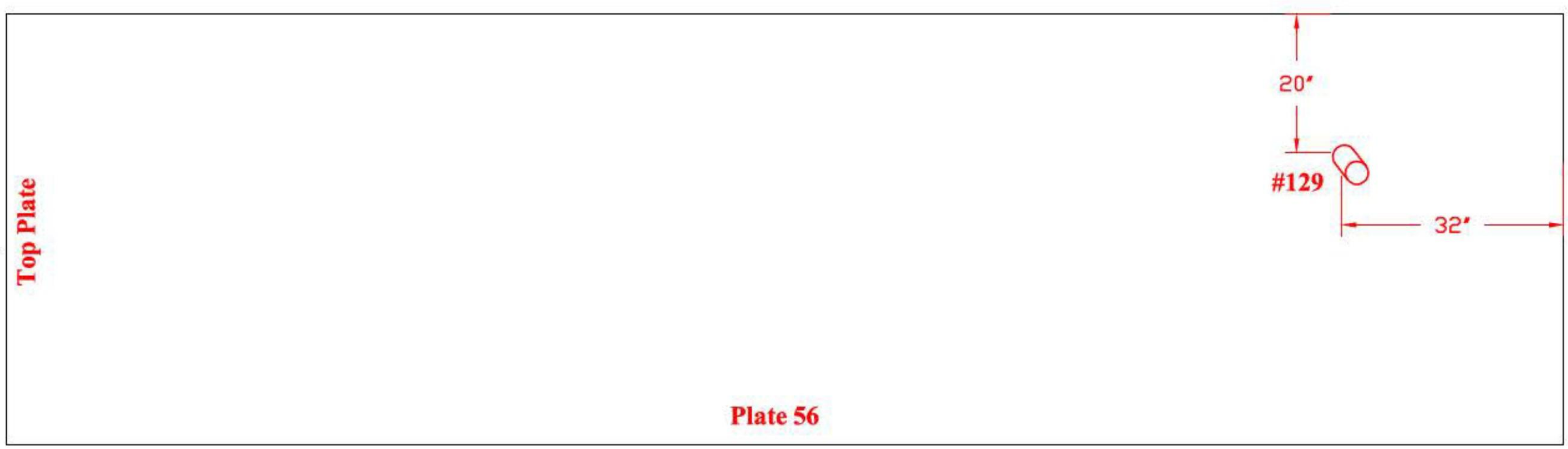


Tank Section: Lower Dome
Quadrant: D

Course: 4
Plate #: 56

Flaw # - Type - Remaining:

#129 - Grout Nozzle - 0.213"R



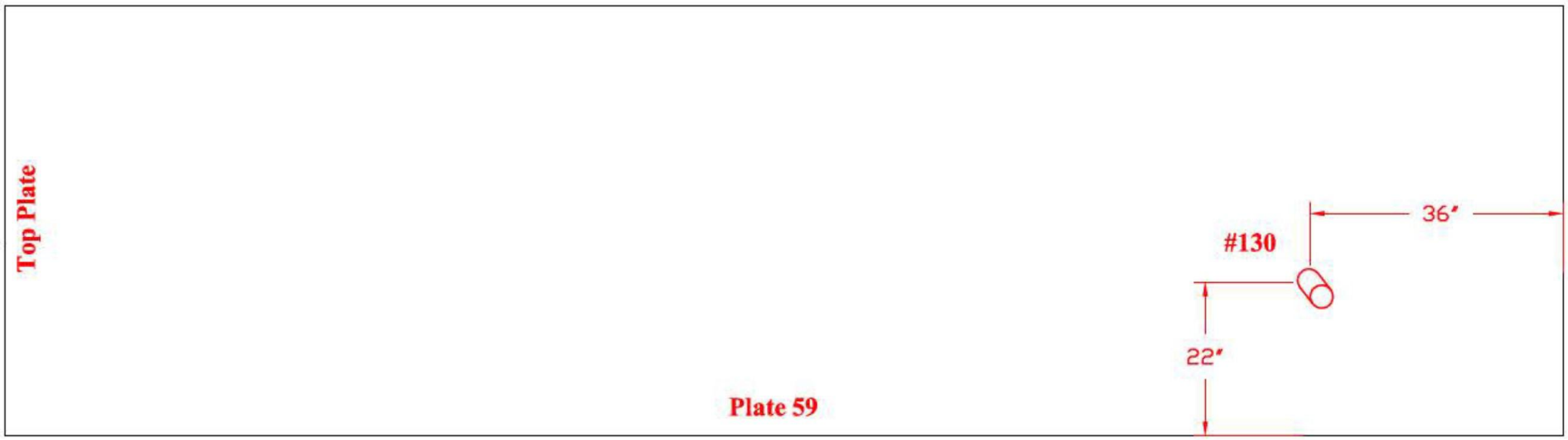
Drawing is not to scale

TANK # 20 - QUADRANT D
***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: D

Course: 4
Plate #: 59
Flaw # - Type - Remaining:

#130 - Grout Nozzle - 0.207"R

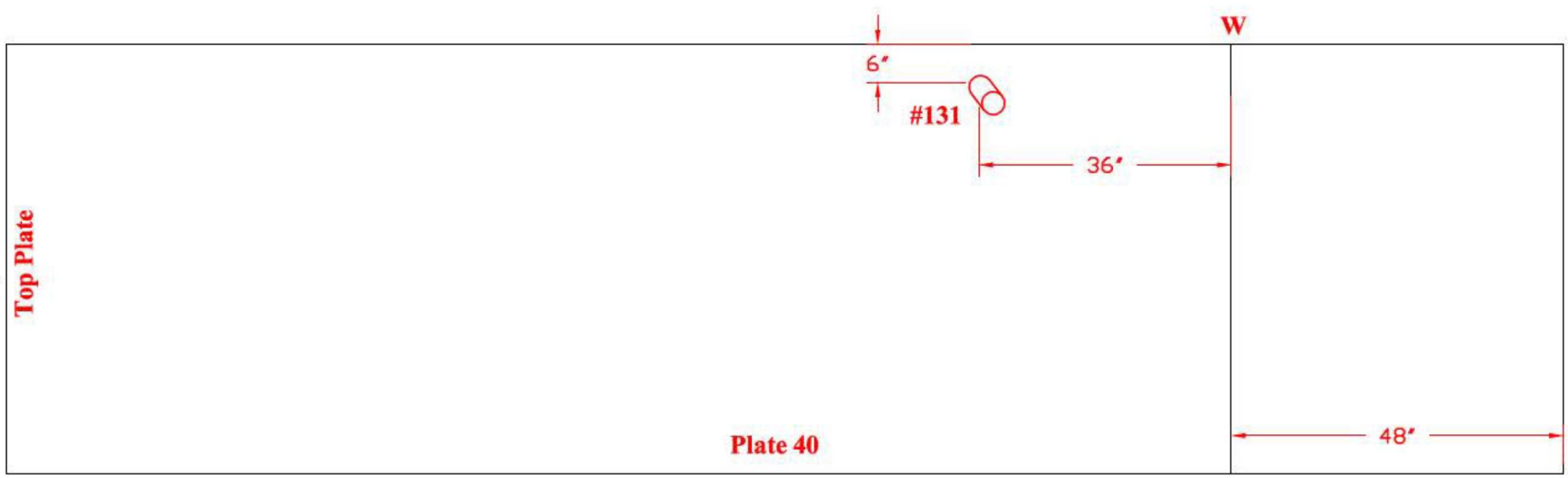


Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 40

Flaw # - Type - Remaining:

#131 - Grout Nozzle - 0.212"R



Drawing is not to scale

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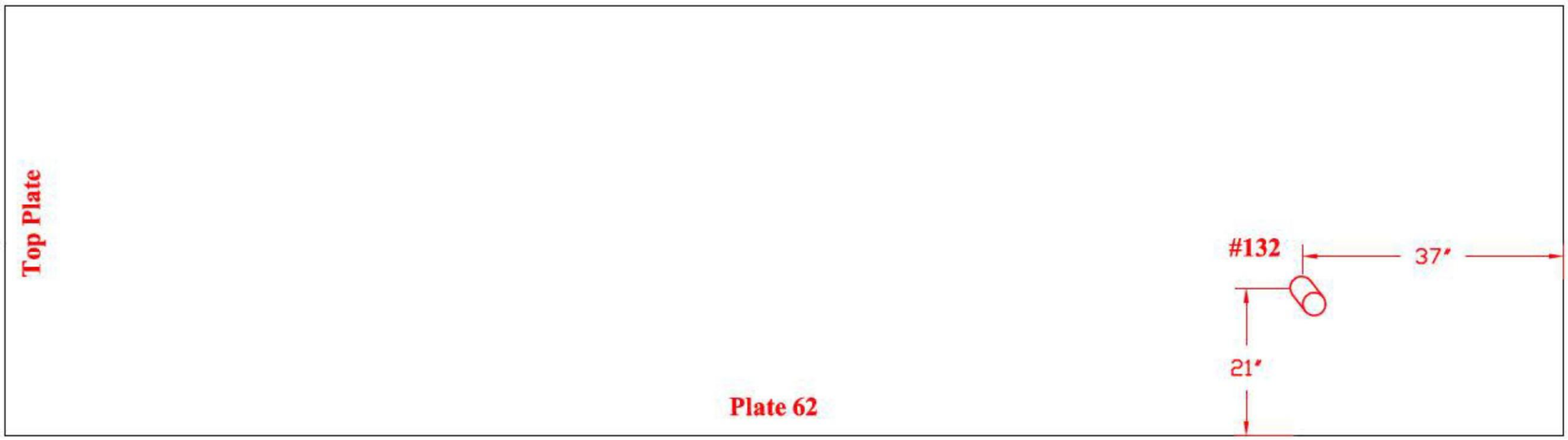
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: D

Course: 4
Plate #: 62
Flaw # - Type - Remaining:

#132 - Grout Nozzle - 0.205"R

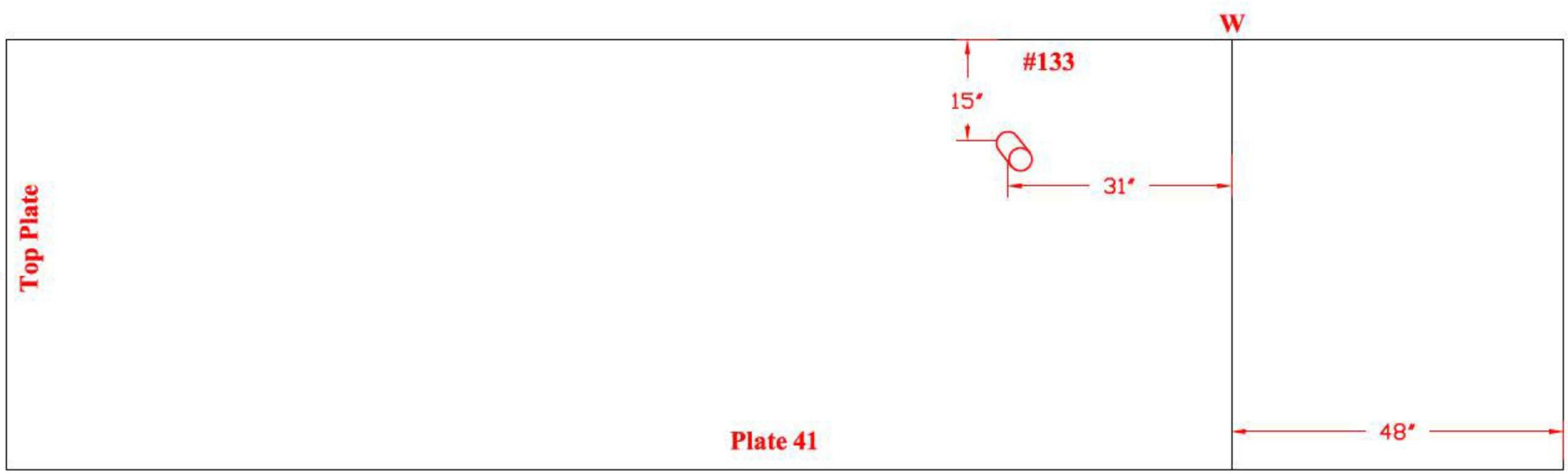


Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 41

Flaw # - Type - Remaining:

#133 - Grout Nozzle - 0.210"R



Drawing is not to scale

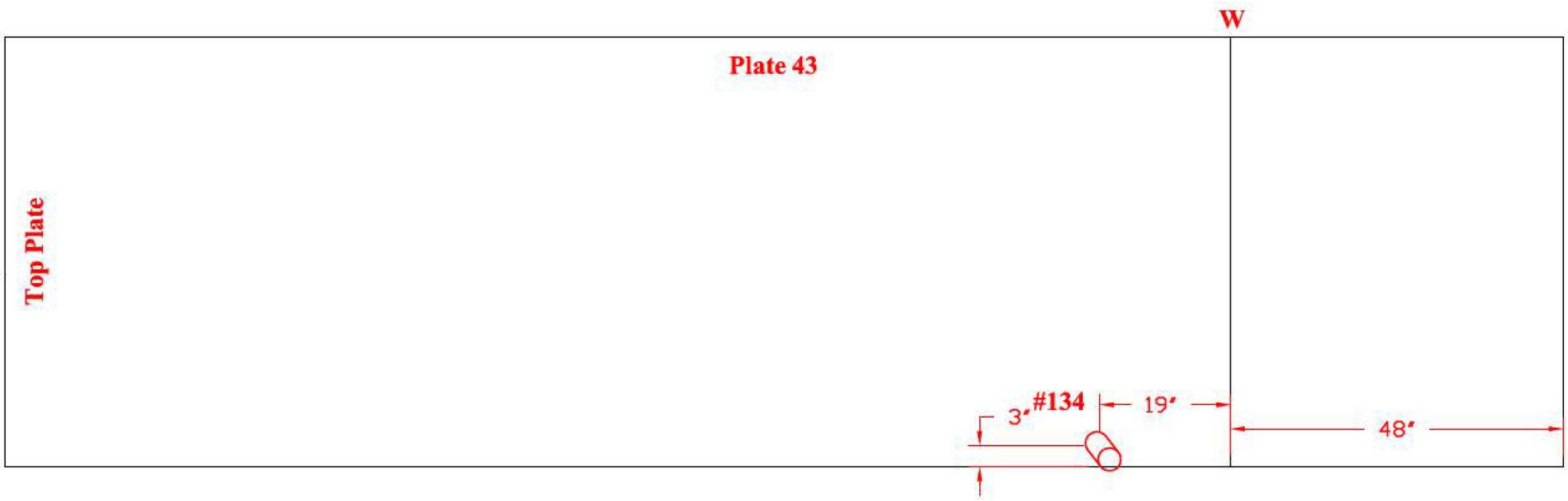
TANK # 20 - QUADRANT D

***Nominal Plate Thickness: 0.250"**

Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 43
Flaw # - Type - Remaining:

#134 - Grout Nozzle - 0.224"R

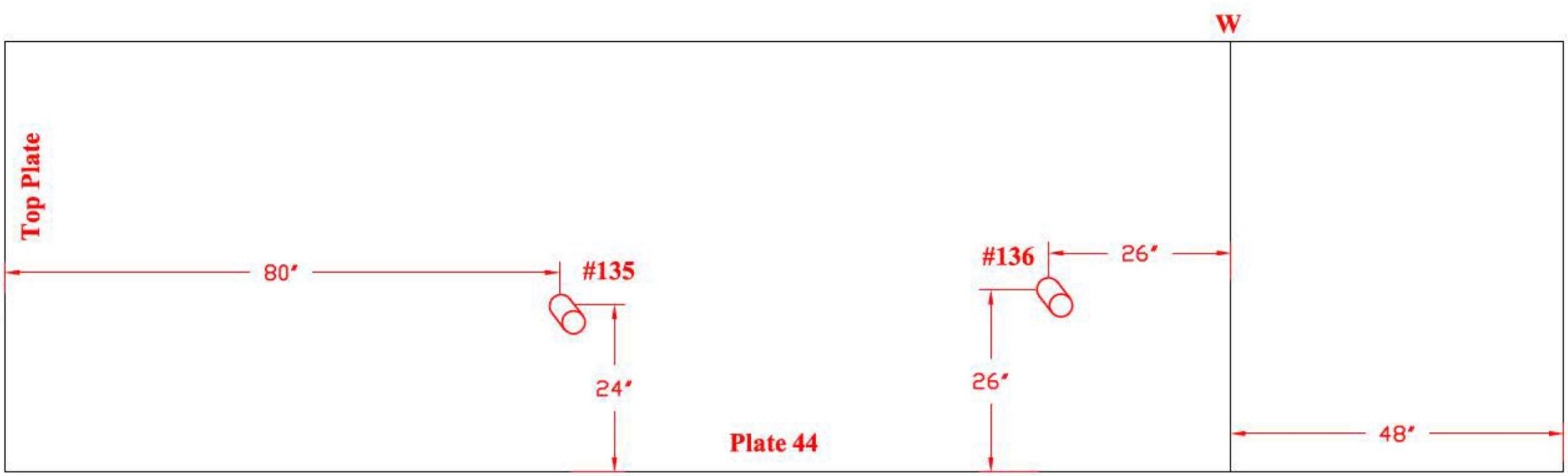


Tank Section: Lower Dome
Quadrant: D

Course: 3
Plate #: 44

Flaw # - Type - Remaining:

#135 - Grout Nozzle - 0.228"R
#136 - Grout Nozzle - 0.224"R



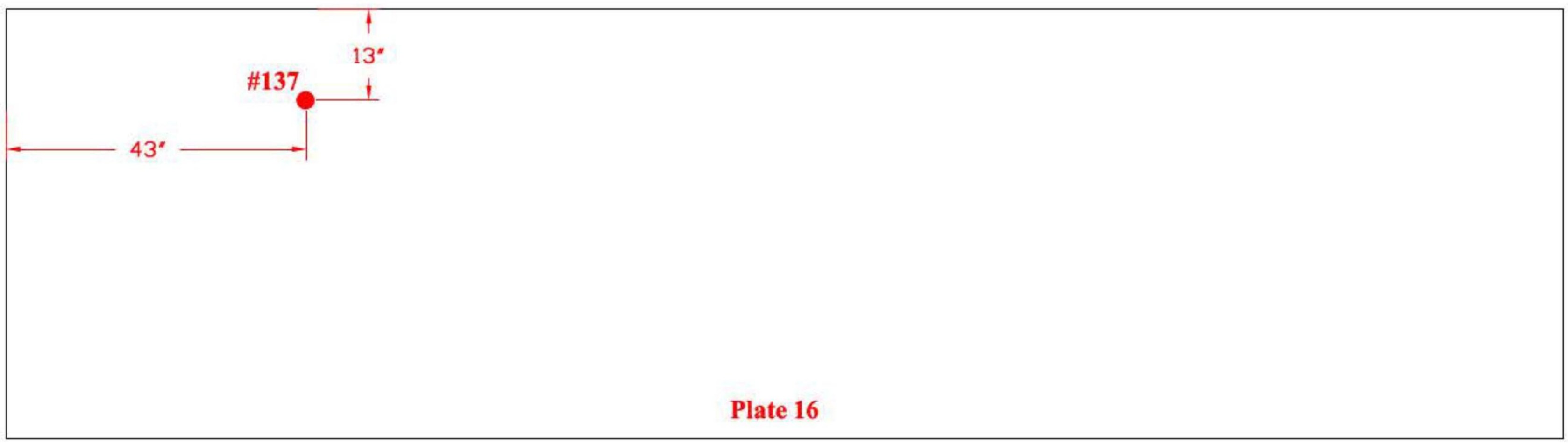
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: D

Course: 26
Plate #: 16
Flaw # - Type - Remaining:

#137 - Dent - 0.100" deep

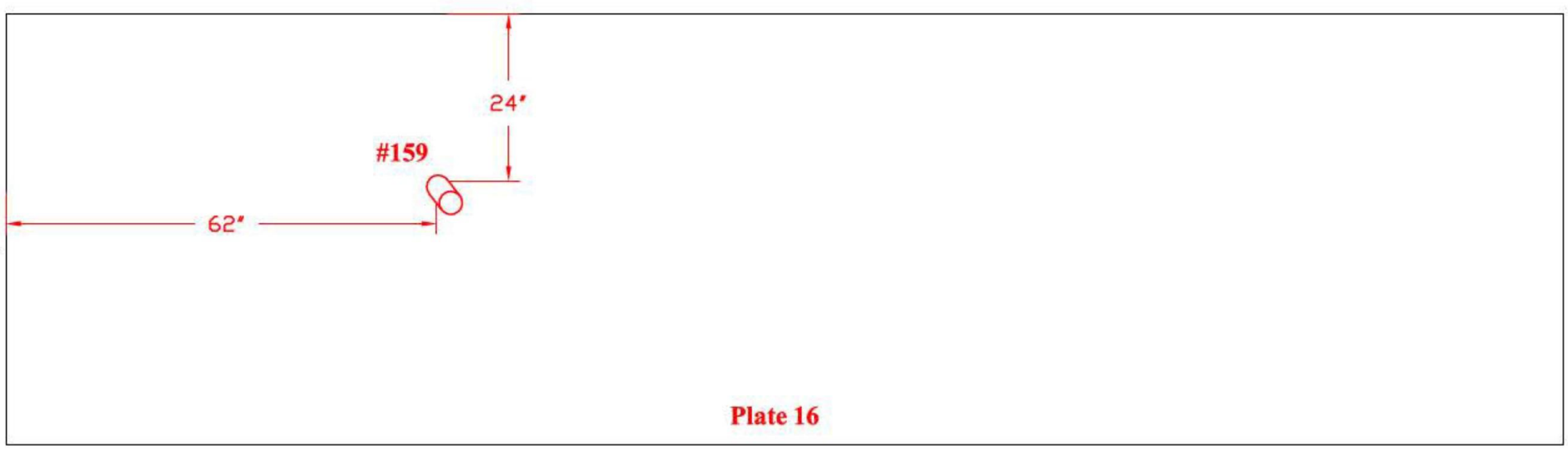


Tank Section: Barrel
Quadrant: D

Course: 5
Plate #: 16

Flaw # - Type - Remaining:

#138 - Grout Nozzle - 0.196"R



Drawing is not to scale

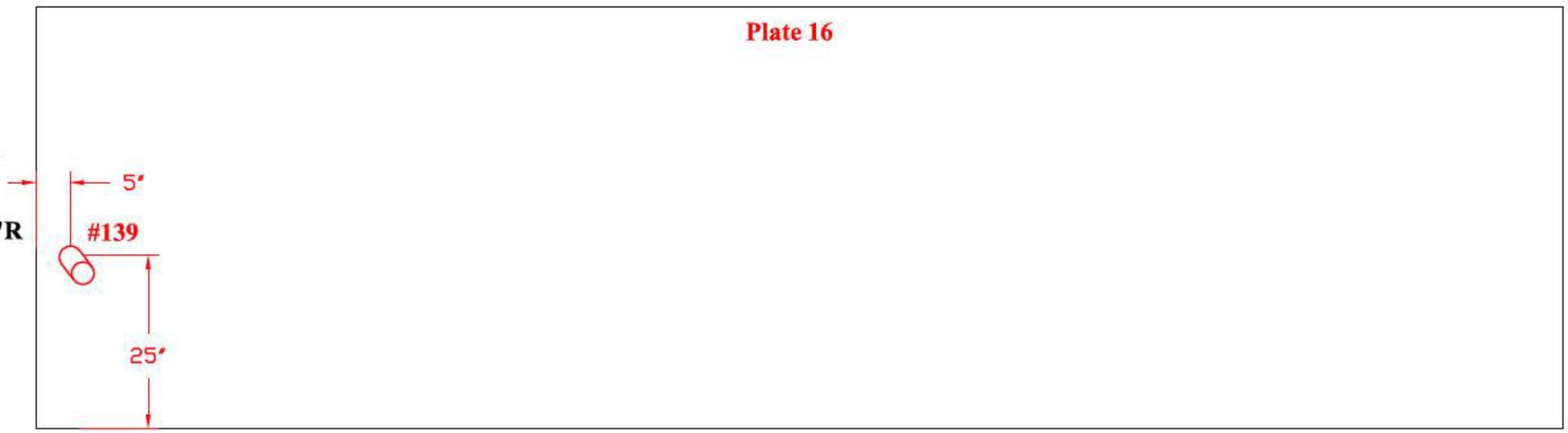
TANK # 20 - QUADRANT D

Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: D

Course: 19
Plate #: 16
Flaw # - Type - Remaining:

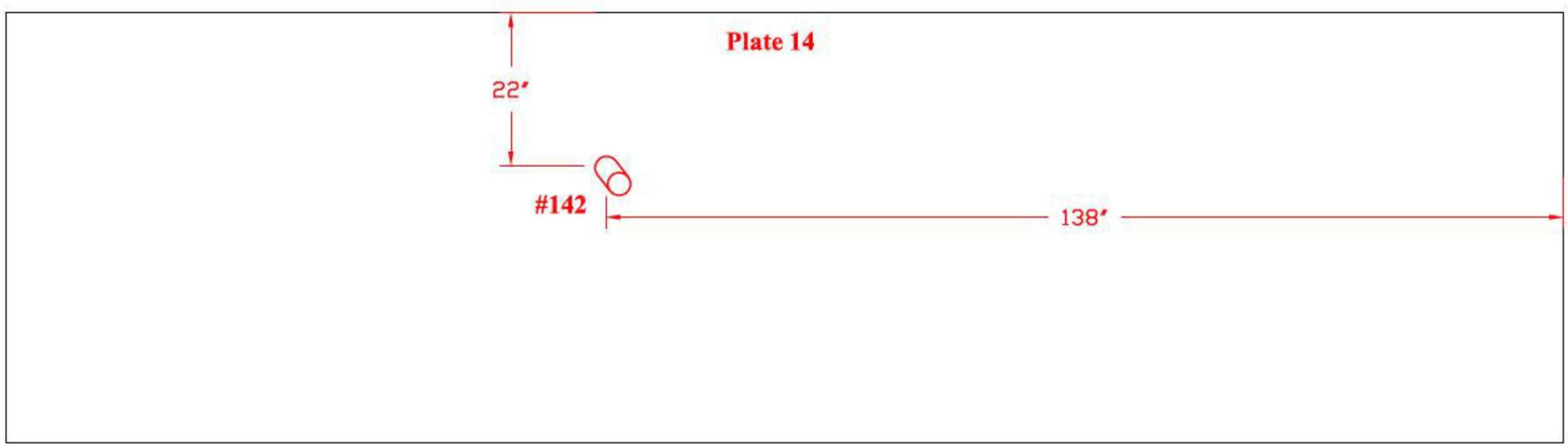
#139 - Grout Nozzle - 0.218"R



Tank Section:
Quadrant: D

Course: 12
Plate #: 14
Flaw # - Type - Remaining:

#142 - Grout Nozzle - 0.226"R



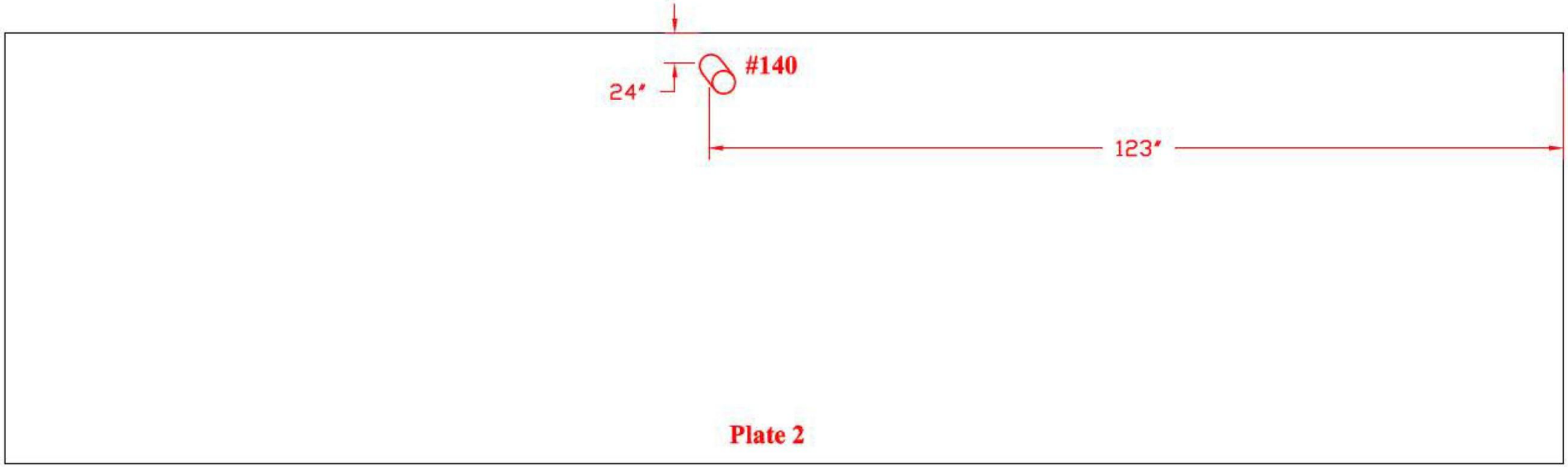
Drawing is not to scale

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 12
Plate #: 2
Flaw # - Type - Remaining:

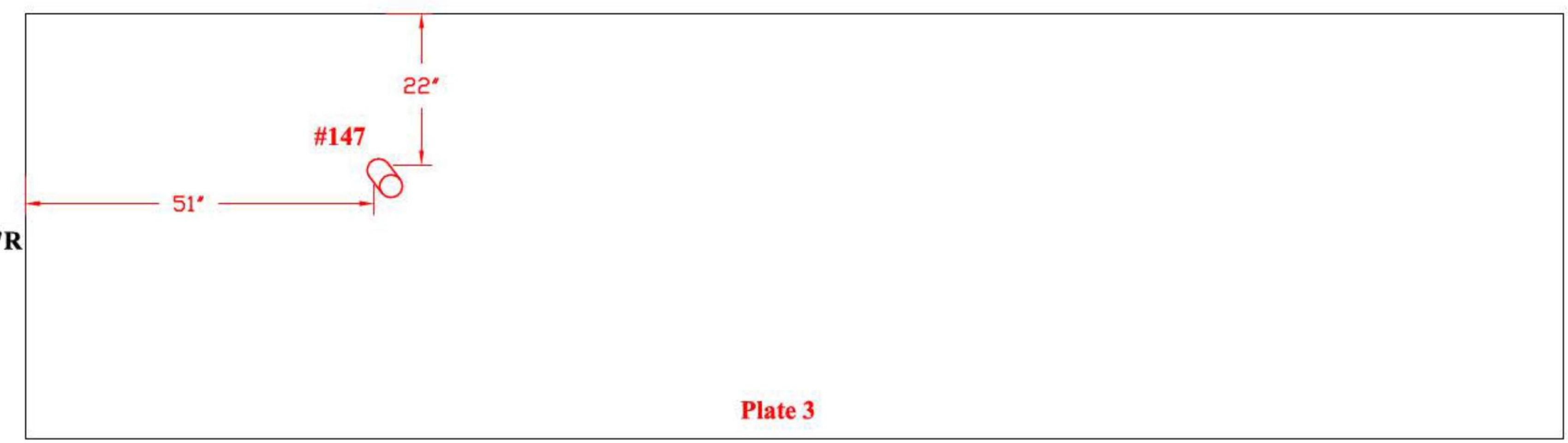
#140 - Grout Nozzle - 0.219"R



Tank Section: Barrel
Quadrant: A

Course: 19
Plate #: 3
Flaw # - Type - Remaining:

#141 - Grout Nozzle - 0.204"R



Drawing is not to scale

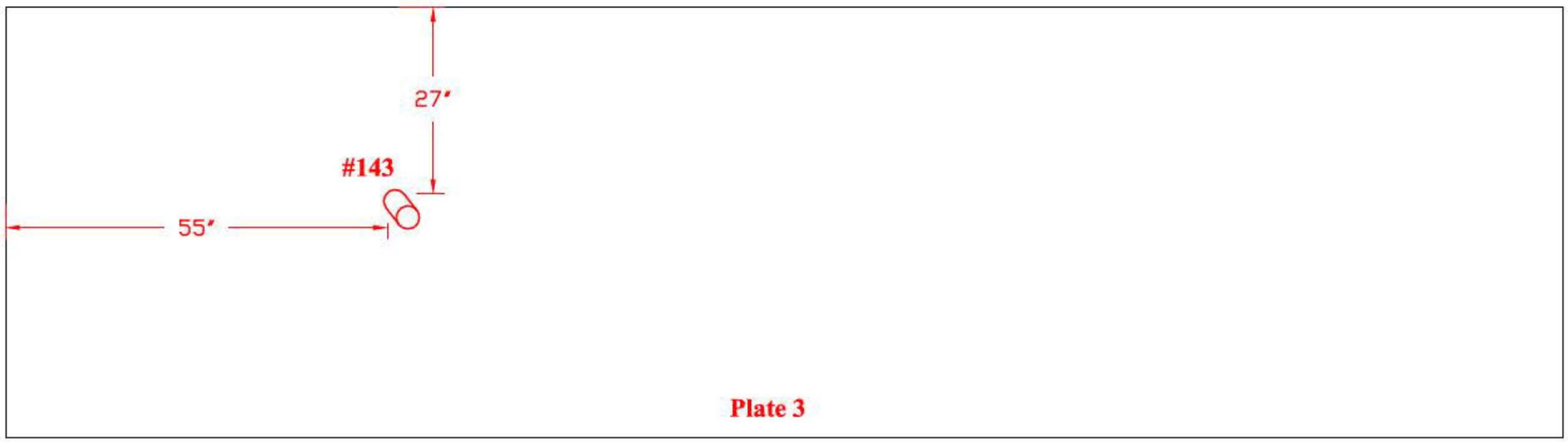
TANK # 20 - QUADRANT A AND B

Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 27
Plate #: 3
Flaw # - Type - Remaining:

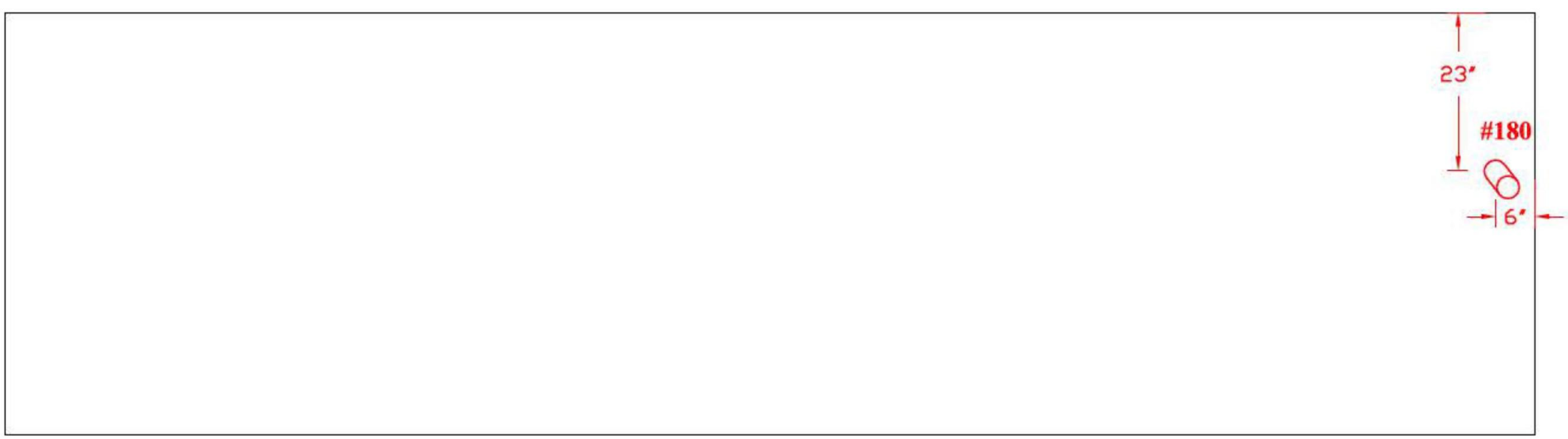
#143 - Grout Nozzle - 0.202"R



Tank Section: Barrel
Quadrant: B

Course: 27
Plate #: 8
Flaw # - Type - Remaining:

#180 - Grout Nozzle - 0.203"R



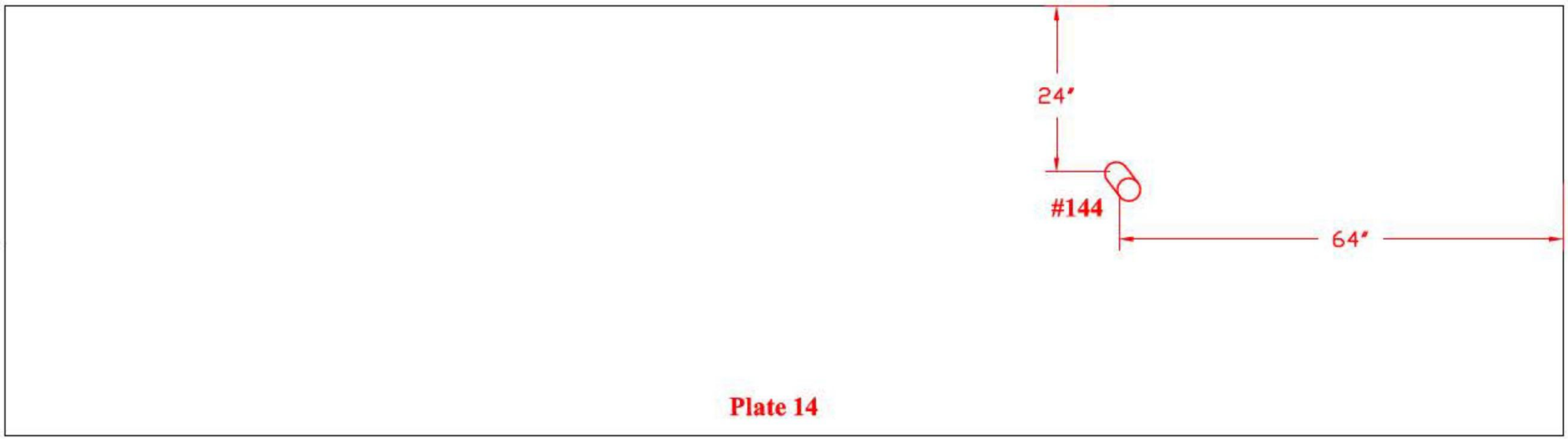
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: D

Course: 1
Plate #: 14
Flaw # - Type - Remaining:

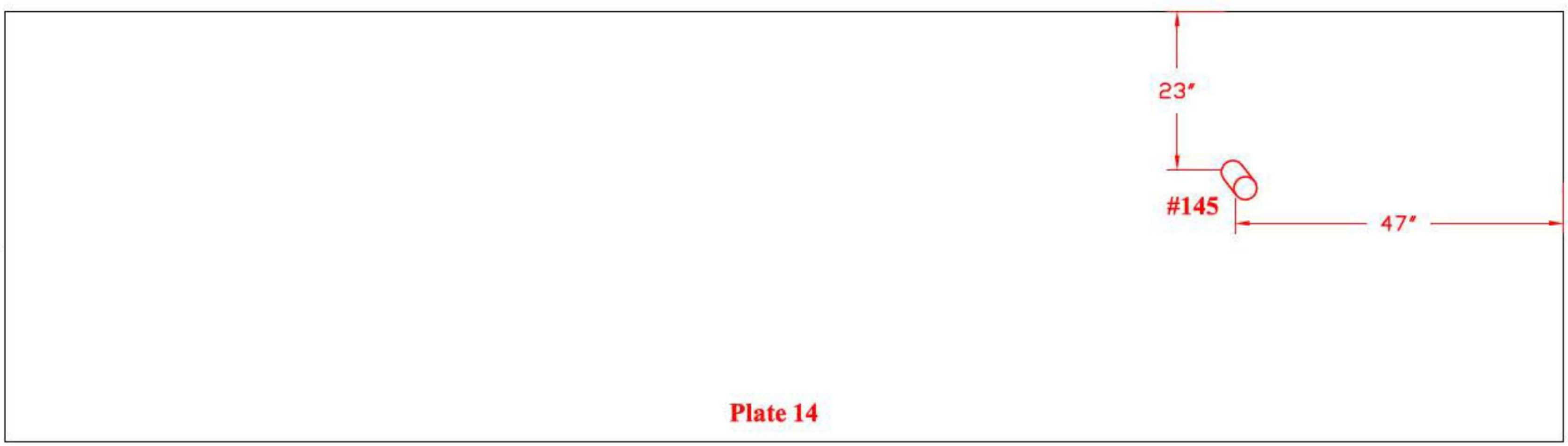
#144 - Grout Nozzle - 0.208"R



Tank Section: Barrel
Quadrant: D

Course: 5
Plate #: 14
Flaw # - Type - Remaining:

#145 - Grout Nozzle - 0.204"R



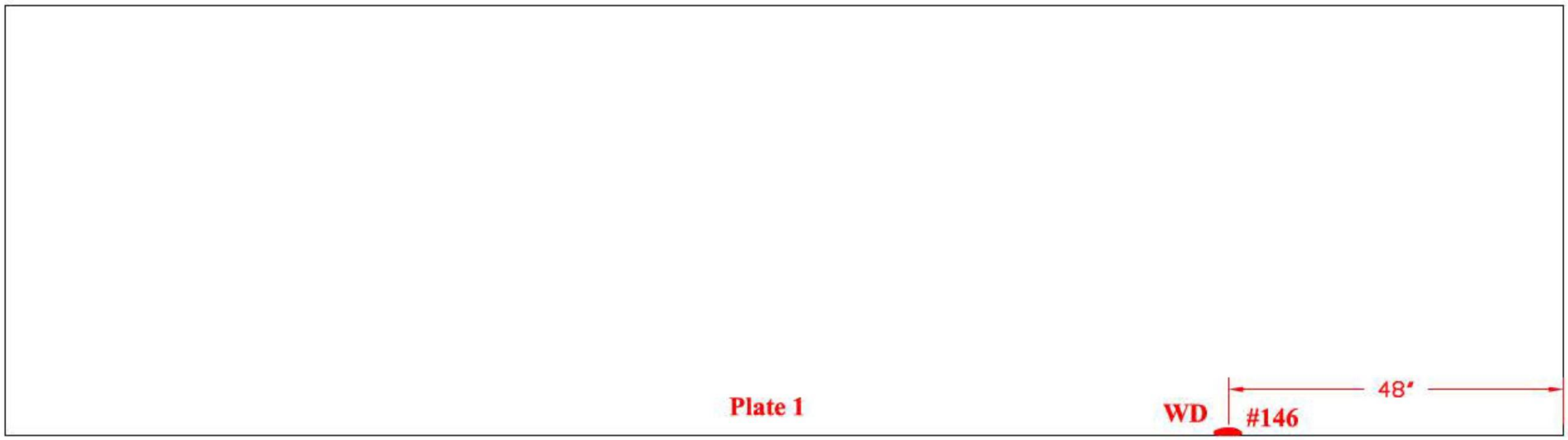
Drawing is not to scale

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 11
Plate #: 1
Flaw # - Type - Remaining:

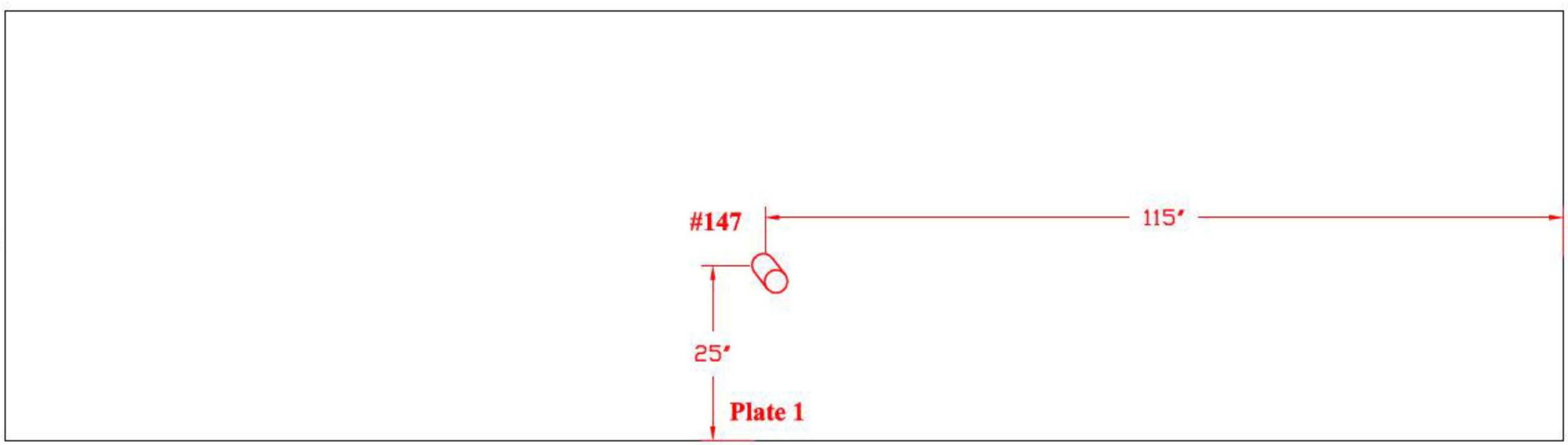
#146: LOF - .157" 5"L



Tank Section: Barrel
Quadrant: A

Course: 12
Plate #: 1
Flaw # - Type - Remaining:

#147 - Grout Nozzle - 0.230"R



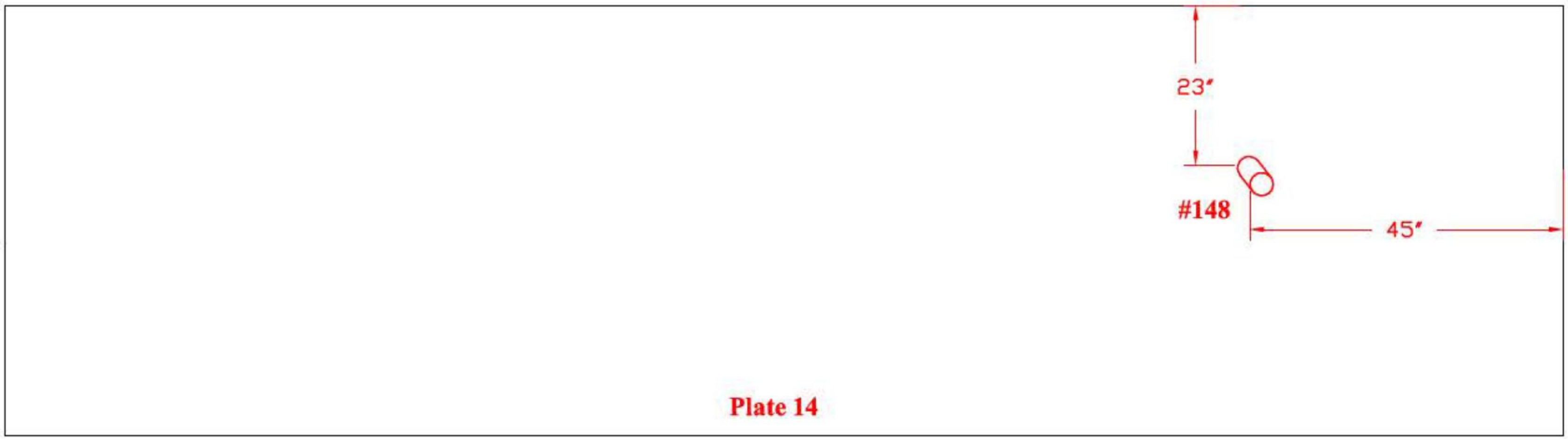
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: D

Course: 19
Plate #: 14
Flaw # - Type - Remaining:

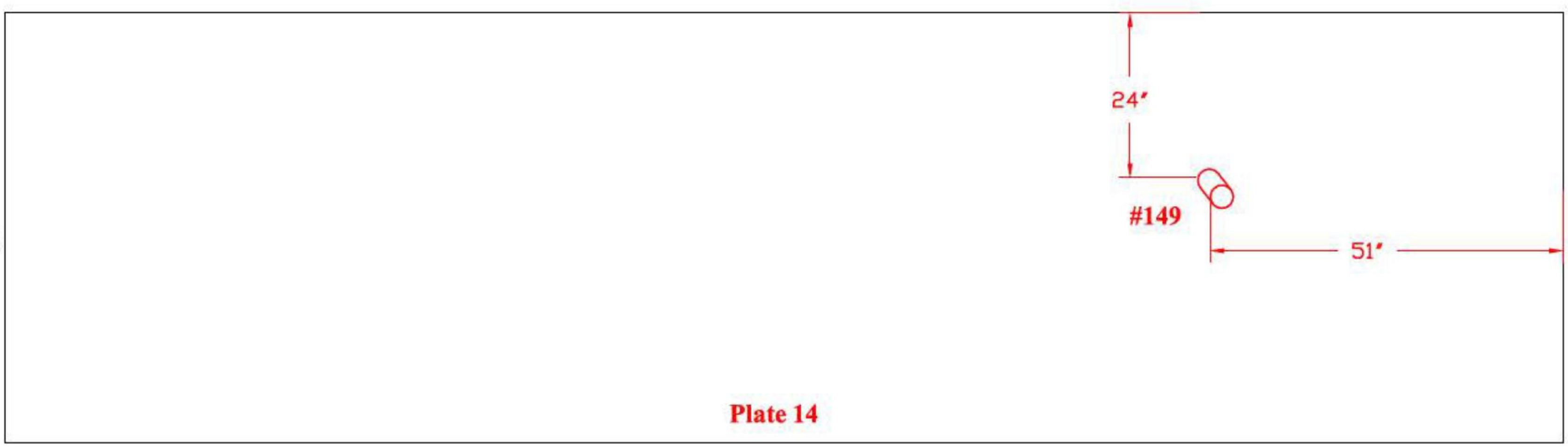
#148 - Grout Nozzle - 0.210"R



Tank Section: Barrel
Quadrant: D

Course: 27
Plate #: 14
Flaw # - Type - Remaining:

#149 - Grout Nozzle - 0.207"R



Drawing is not to scale

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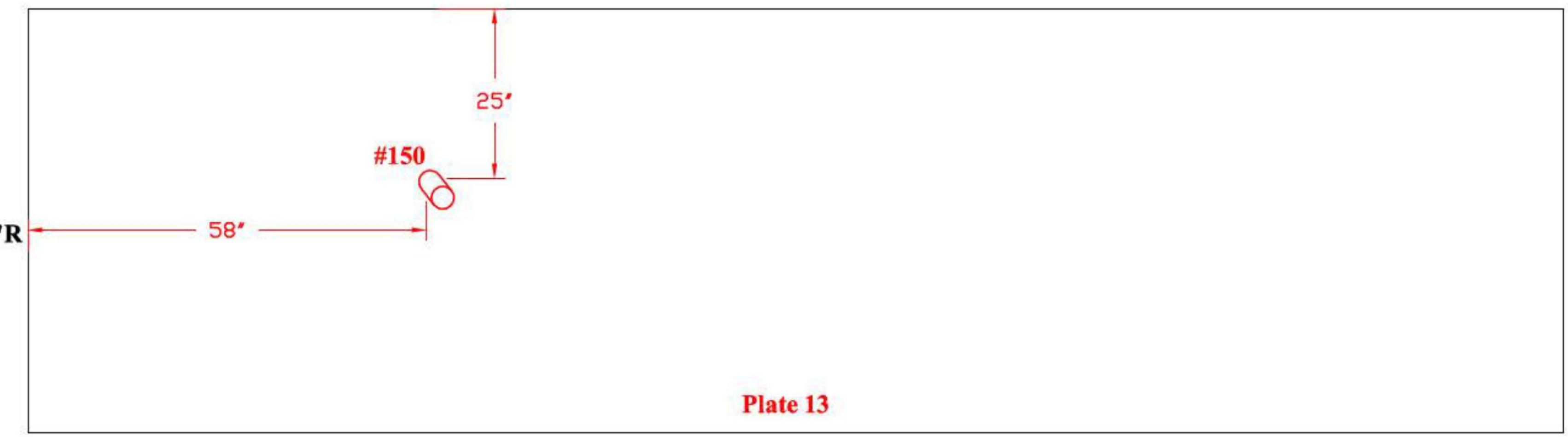
TANK # 20 - QUADRANT D
***Nominal Plate Thickness: 0.250"**

Tank Section: Barrel
Quadrant: D

Course: 12
Plate #: 13
Flaw # - Type - Remaining:

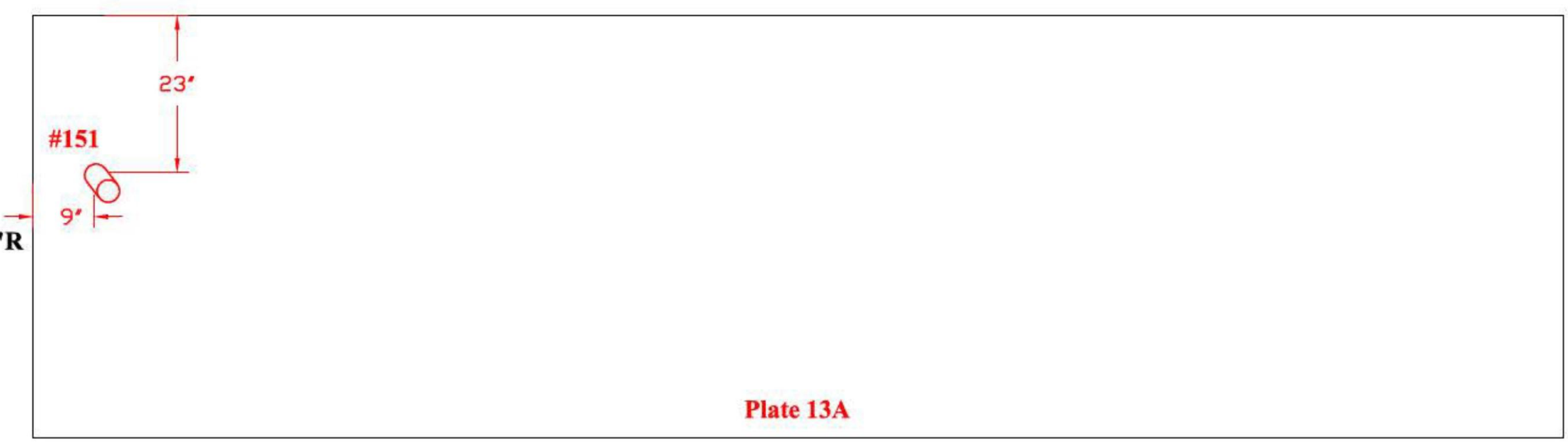
#150 - Grout Nozzle - 0.202"R



Tank Section: Barrel
Quadrant: D

Course: 19
Plate #: 13A
Flaw # - Type - Remaining:

#151 - Grout Nozzle - 0.212"R



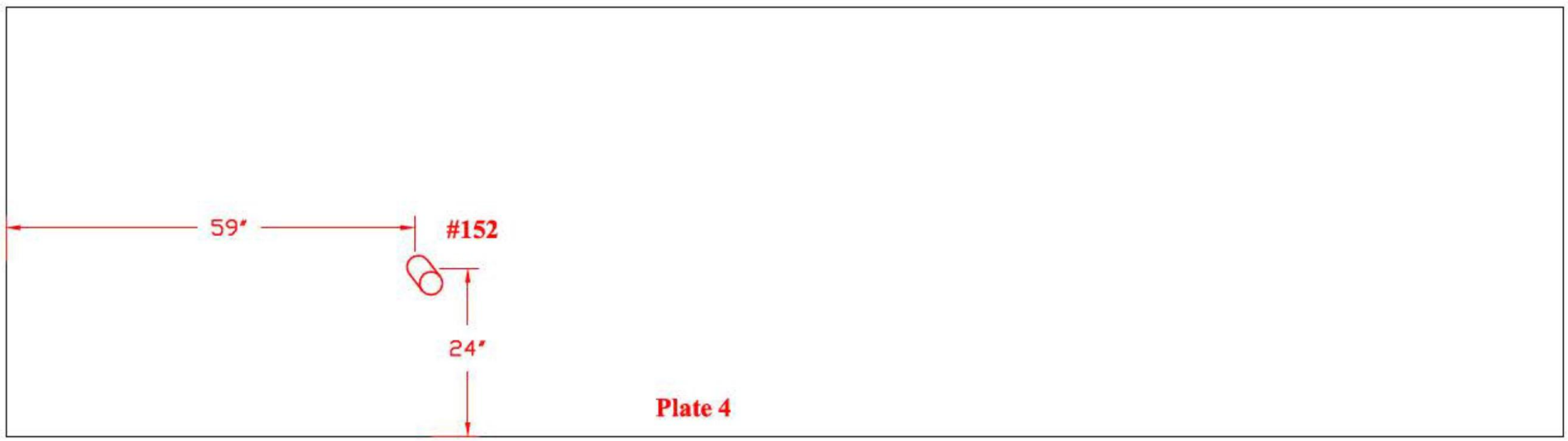
Drawing is not to scale

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 19
Plate #: 4
Flaw # - Type - Remaining:

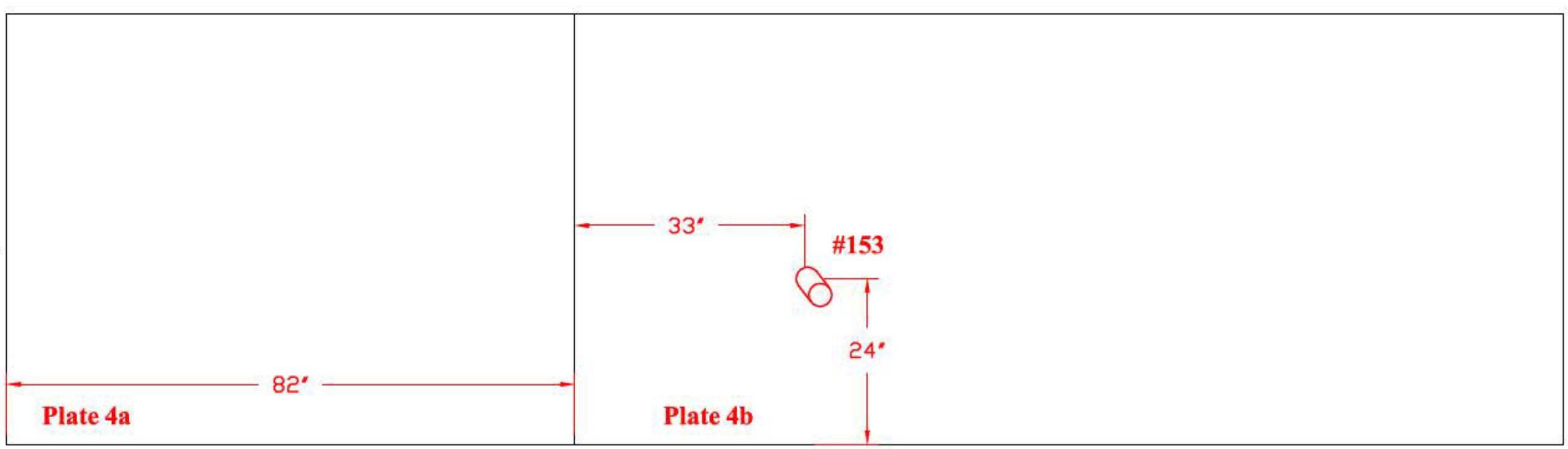
#152 - Grout Nozzle - 0.230"R



Tank Section: Barrel
Quadrant: A

Course: C
Plate #: 4b
Flaw # - Type - Remaining:

#153 - Grout Nozzle - 0.224"R



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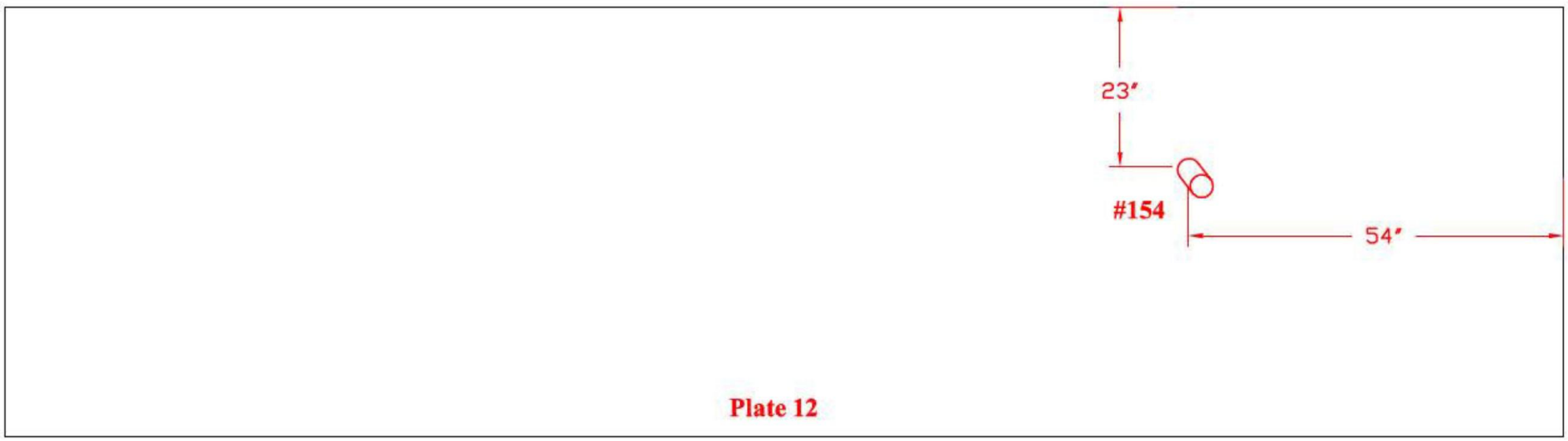
TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: C

Course: 1
Plate #: 12
Flaw # - Type - Remaining:

#154 - Grout Nozzle - 0.204"R

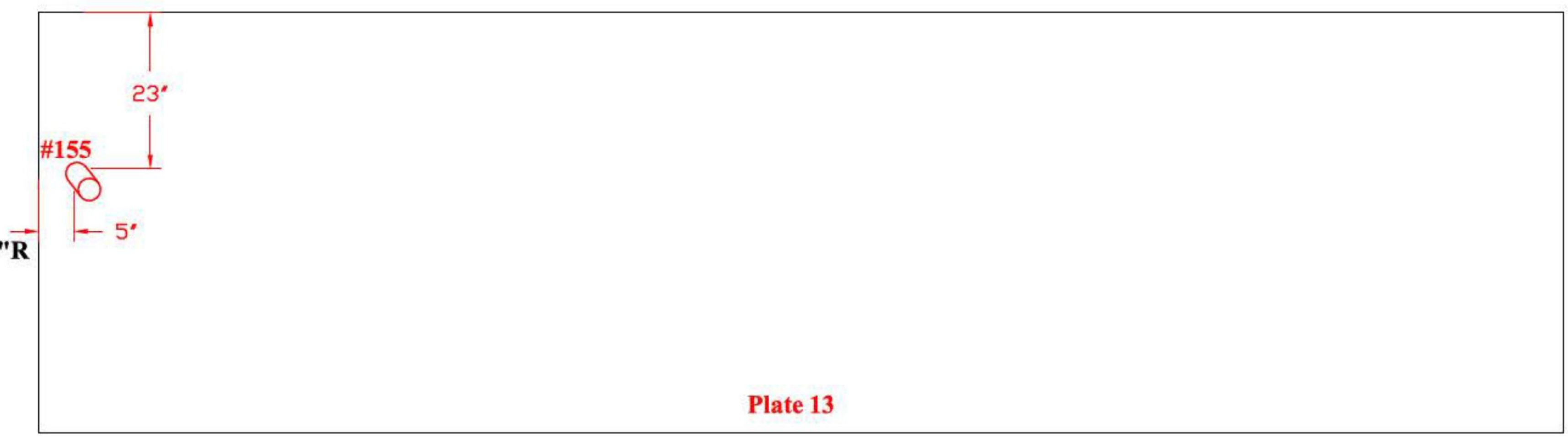


Tank Section: Barrel
Quadrant: D

Course: 5
Plate #: 13

Flaw # - Type - Remaining:

#155 - Grout Nozzle - 0.207"R



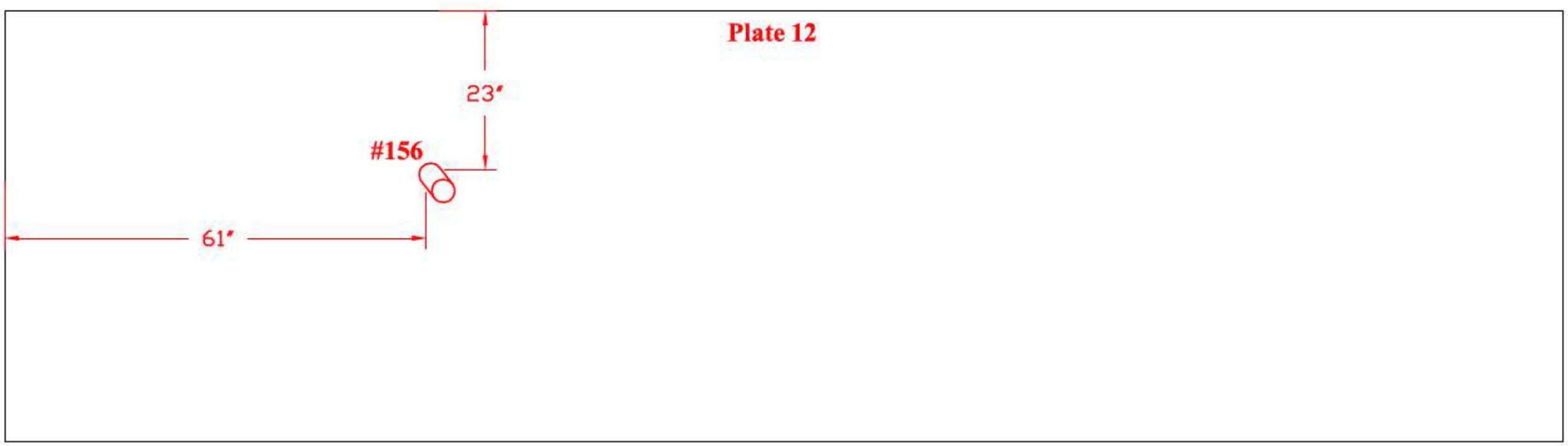
Drawing is not to scale

TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: C

Course: 12
Plate #: 12
Flaw # - Type - Remaining:

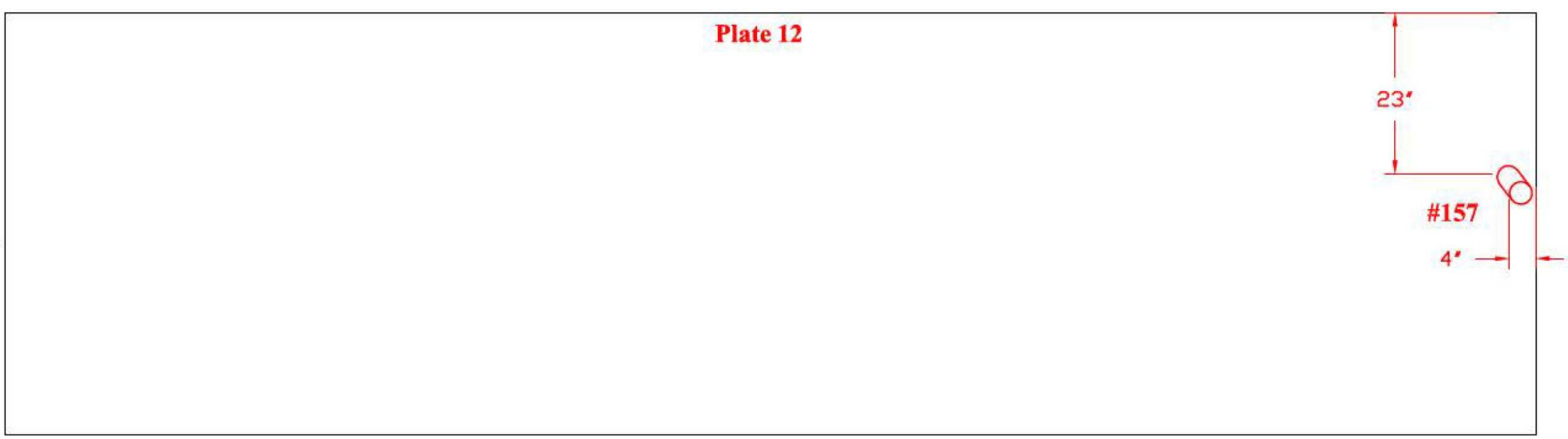
#156 - Grout Nozzle - 0.210"R



Tank Section: Barrel
Quadrant: D

Course: 27
Plate #: 12
Flaw # - Type - Remaining:

#157 - Grout Nozzle - 0.204"R



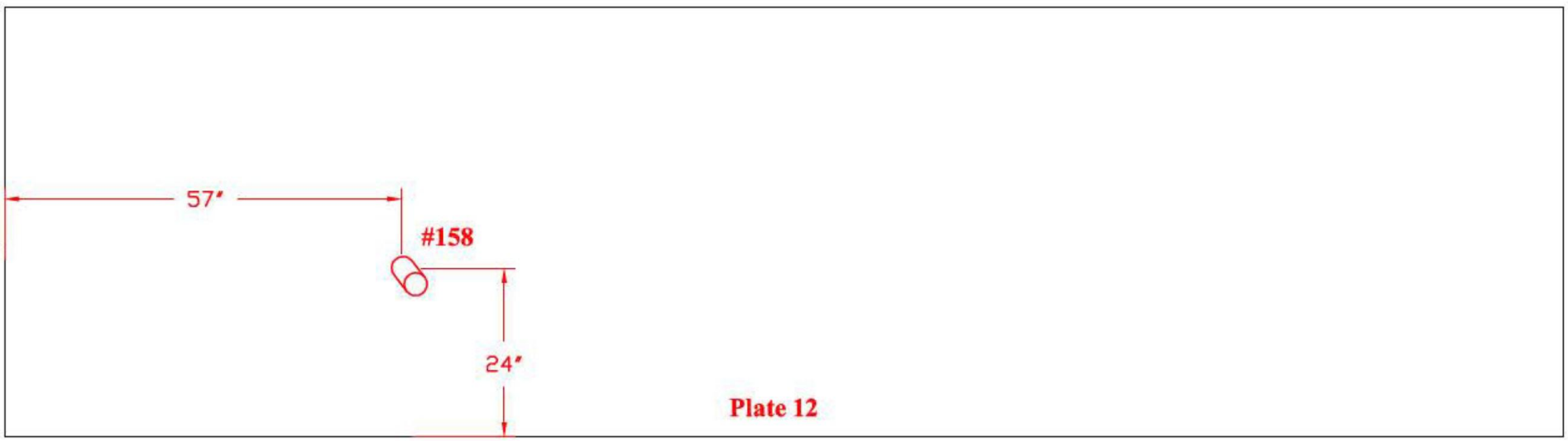
Drawing is not to scale

TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: D

Course: 4
Plate #: 12
Flaw # - Type - Remaining:

#158 - Grout Nozzle - 0.197"R

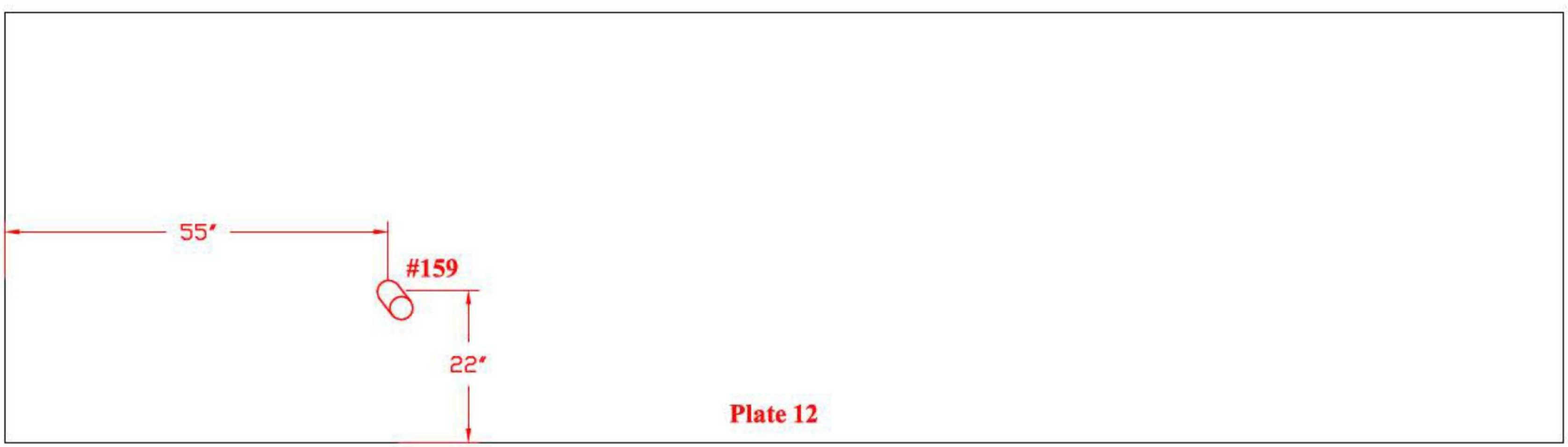


Tank Section: Barrel
Quadrant: C

Course: 19
Plate #: 12

Flaw # - Type - Remaining:

#159 - Grout Nozzle - 0.197"R



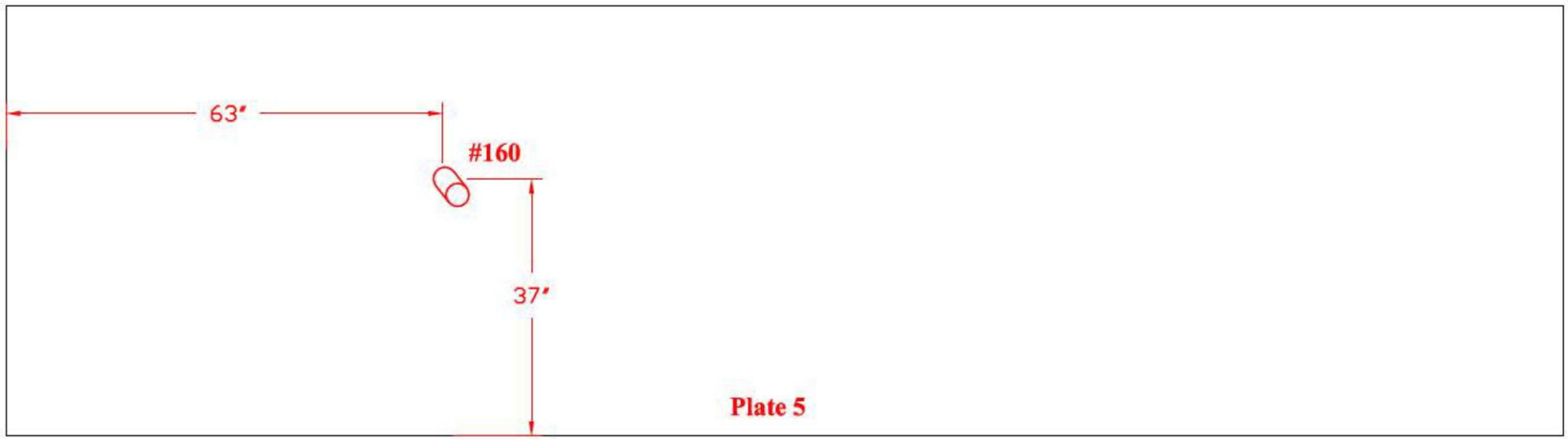
Drawing is not to scale

TANK # 20 - QUADRANT B
***Nominal Plate Thickness: 0.250"**

Tank Section: Barrel
Quadrant: B

Course: 27
Plate #: 5
Flaw # - Type - Remaining:

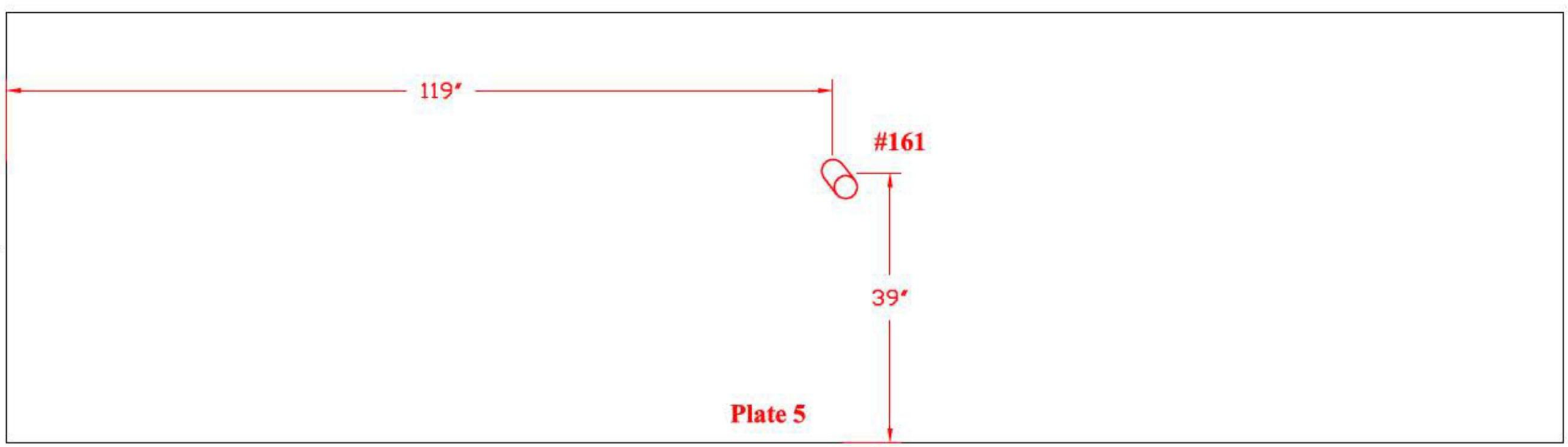
#160 - Grout Nozzle - 0.221"R



Tank Section: Barrel
Quadrant: B

Course: 12
Plate #: 5
Flaw # - Type - Remaining:

#161 - Grout Nozzle - 0.221"R



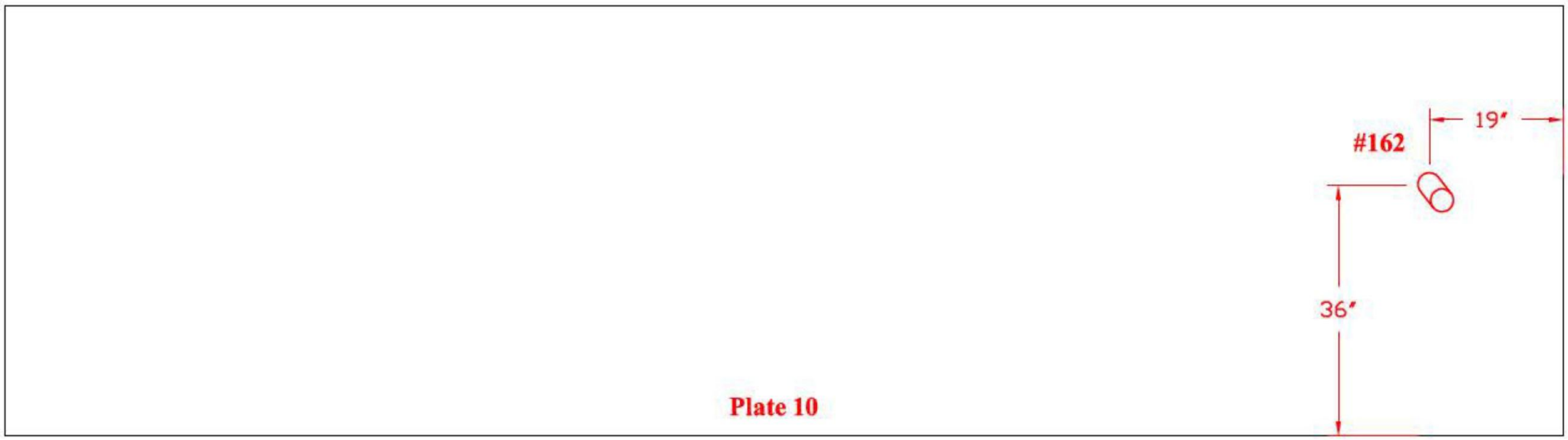
Drawing is not to scale

TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

Tank Section: Barrel
Quadrant: C

Course: 1
Plate #: 10
Flaw # - Type - Remaining:

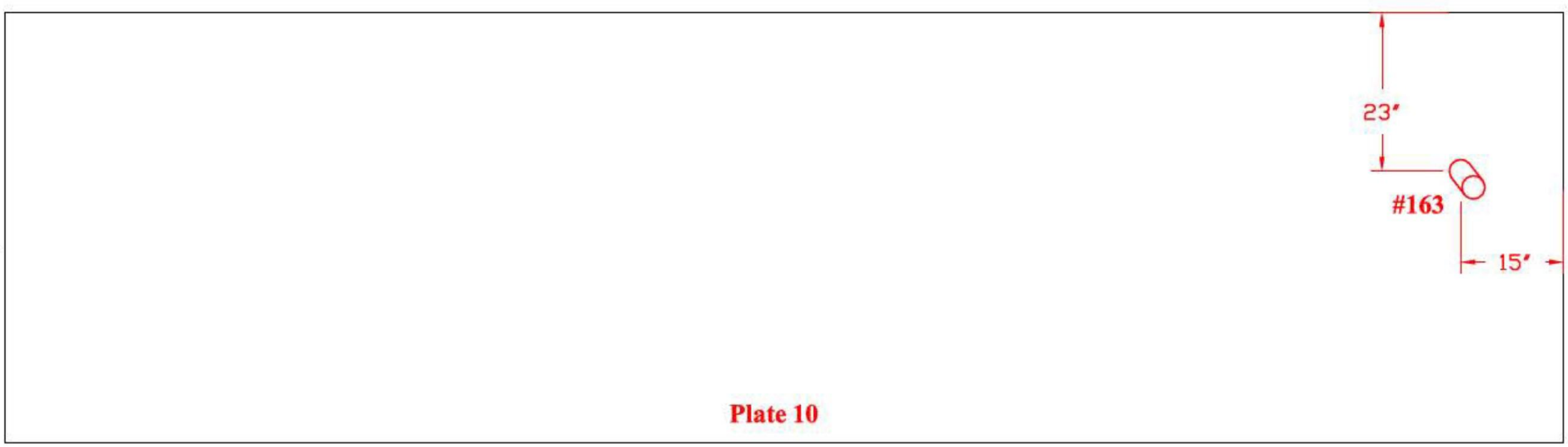
#162 - Grout Nozzle - 0.212"R



Tank Section: Barrel
Quadrant: C

Course: 5
Plate #: 10
Flaw # - Type - Remaining:

#163 - Grout Nozzle - 0.204"R



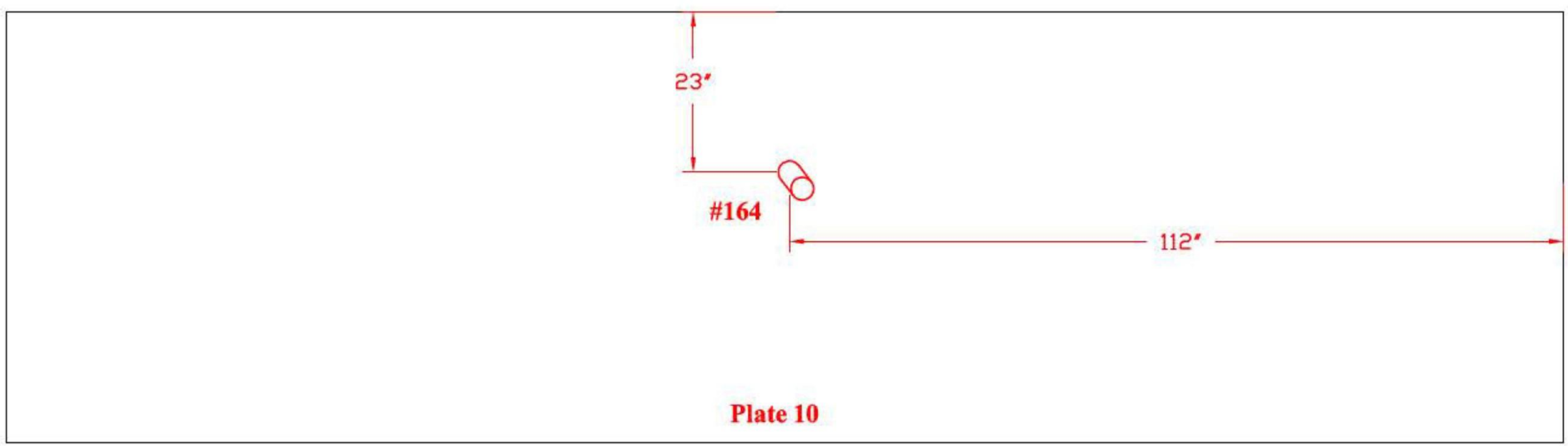
Drawing is not to scale

TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: C

Course: 12
Plate #: 10
Flaw # - Type - Remaining:

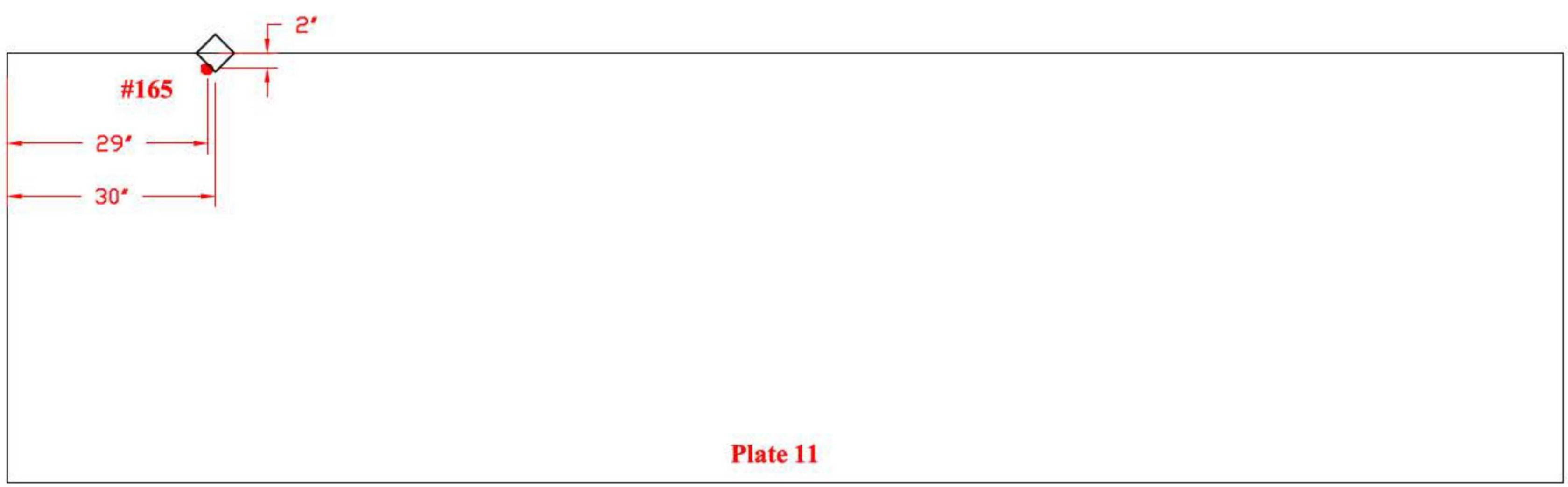
#164 - Grout Nozzle - 0.207"R



Tank Section: Barrel
Quadrant: C

Course: 15
Plate #: 11
Flaw # - Type - Remaining:

#165 - Pit - 0.231"R



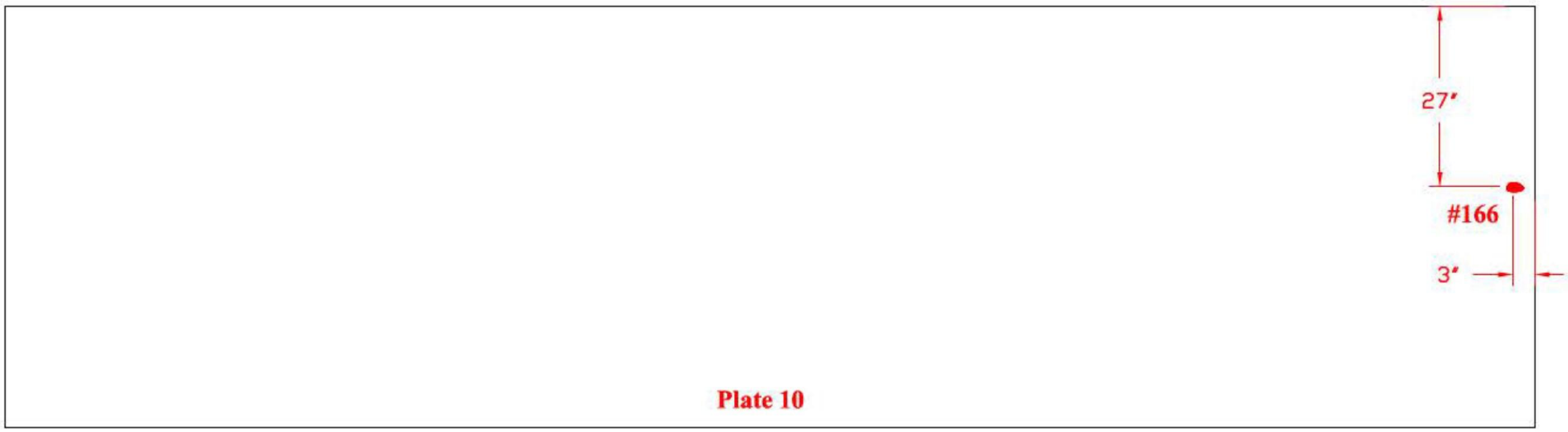
Drawing is not to scale

TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: C

Course: 23
Plate #: 10
Flaw # - Type - Remaining:

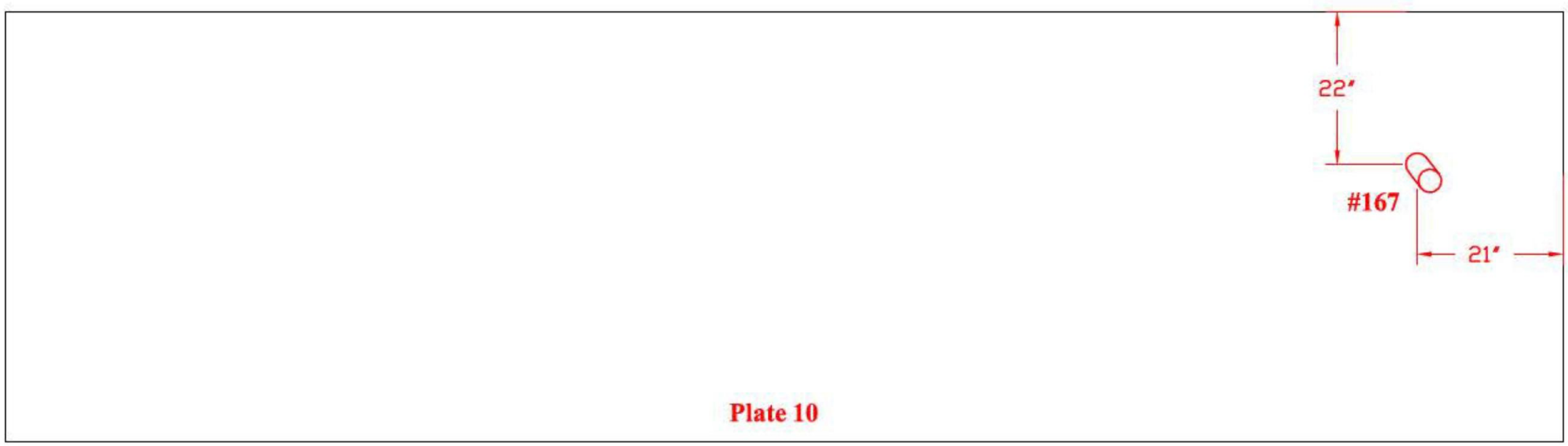
#166 - Gouge - 0.107 D
0.125 L
0.025 W



Tank Section: Barrel
Quadrant: C

Course: 19
Plate #: 10
Flaw # - Type - Remaining:

#167 - Low Spot - 0.204"R



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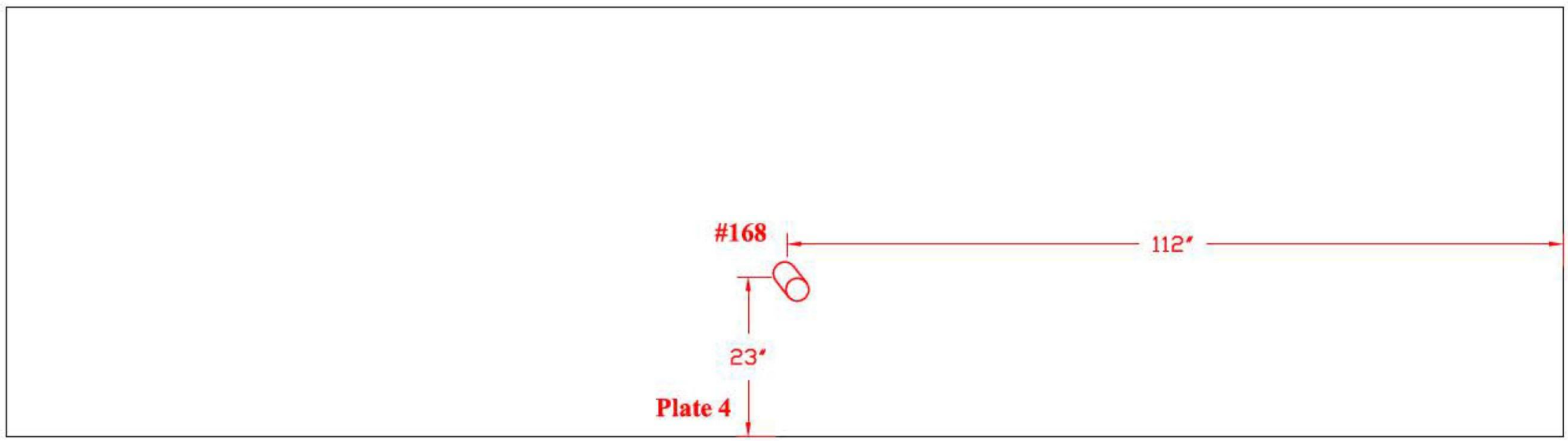
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 12
Plate #: 4
Flaw # - Type - Remaining:

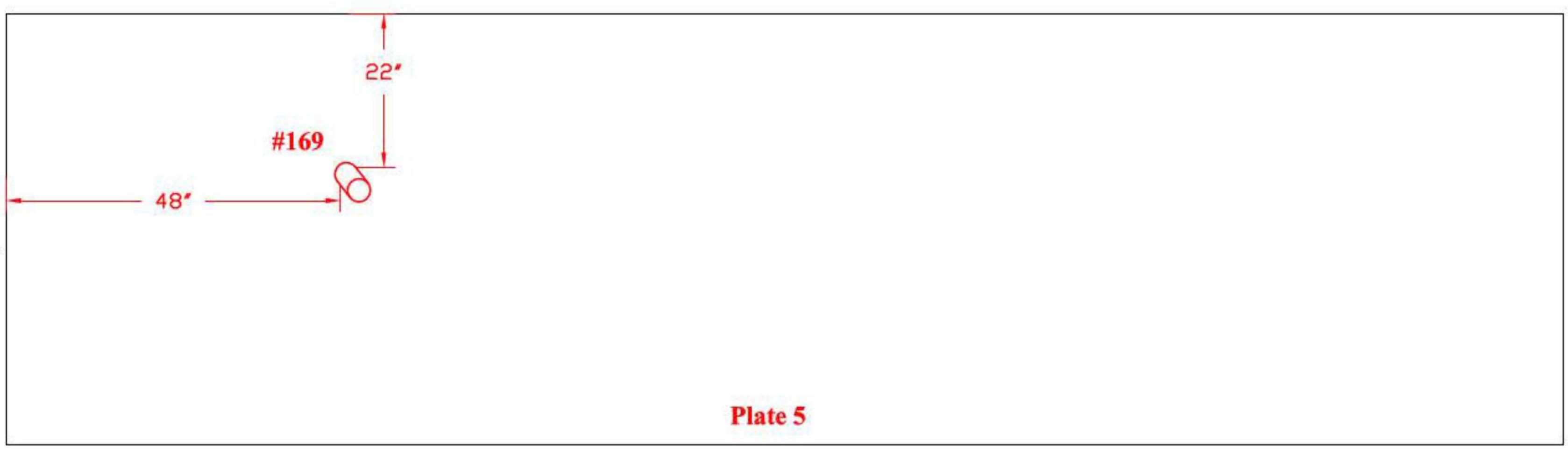
#168 - Grout Nozzle - 0.213"R



Tank Section: Barrel
Quadrant: A

Course: 1
Plate #: 5
Flaw # - Type - Remaining:

#169 - Grout Nozzle - 0.219"R



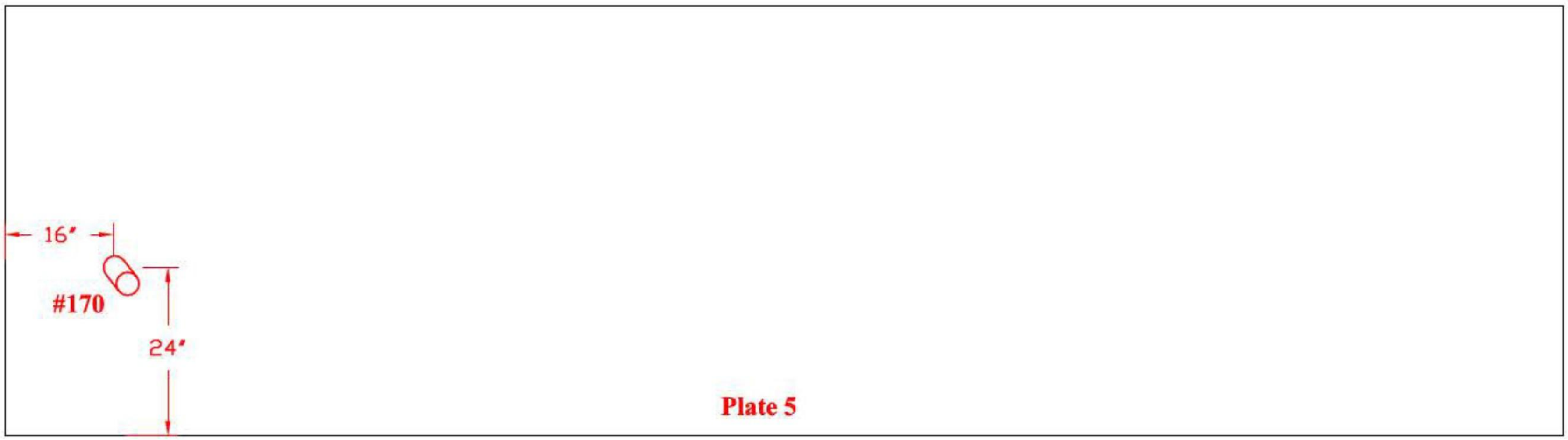
Drawing is not to scale

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 19
Plate #: 5
Flaw # - Type - Remaining:

#170 - Grout Nozzle - 0.224"R



Drawing is not to scale

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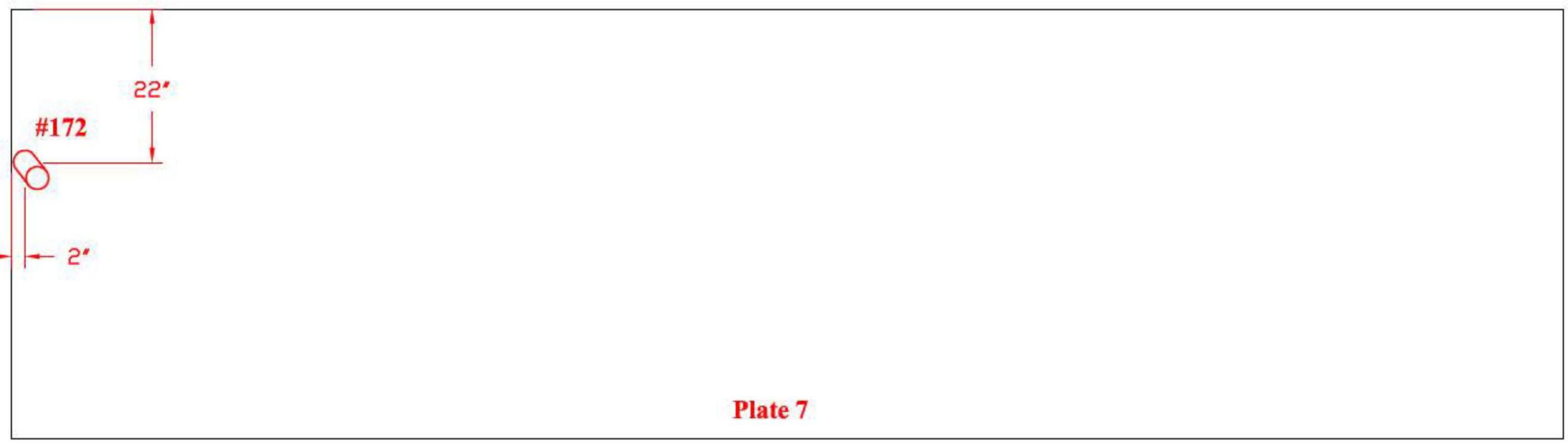
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: B

Course: 19
Plate #: 7
Flaw # - Type - Remaining:

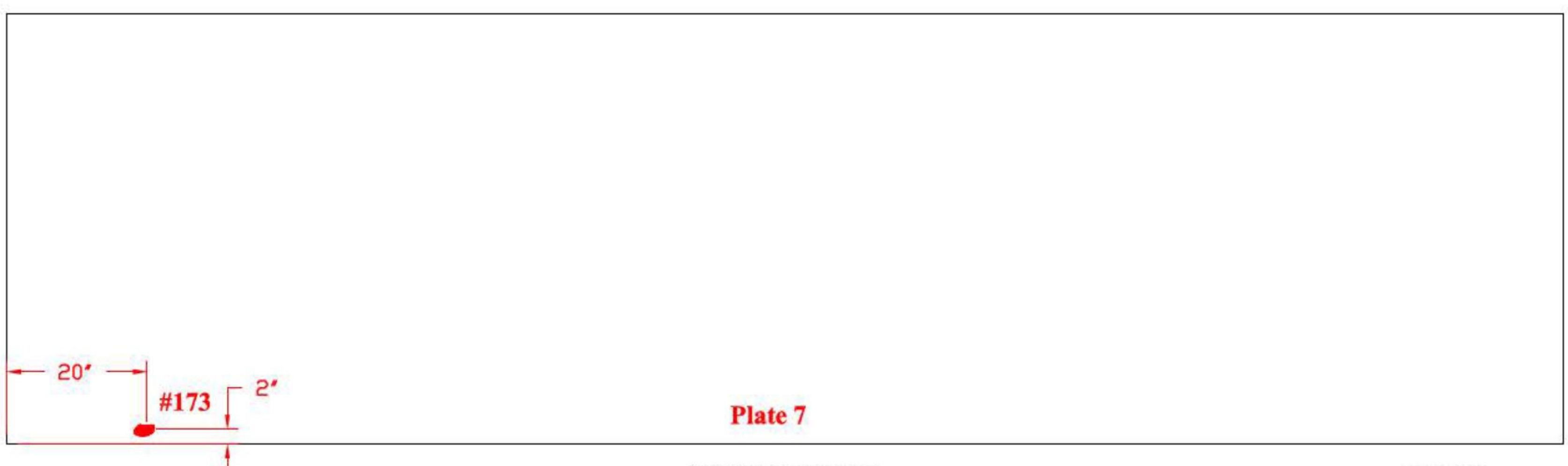
#172 - Grout Nozzle - 0.229"R



Tank Section: Barrel
Quadrant: B

Course: 28
Plate #: 7
Flaw # - Type - Remaining:

#173 - Gouge - 0.140"D
- 1.25"L



Drawing is not to scale

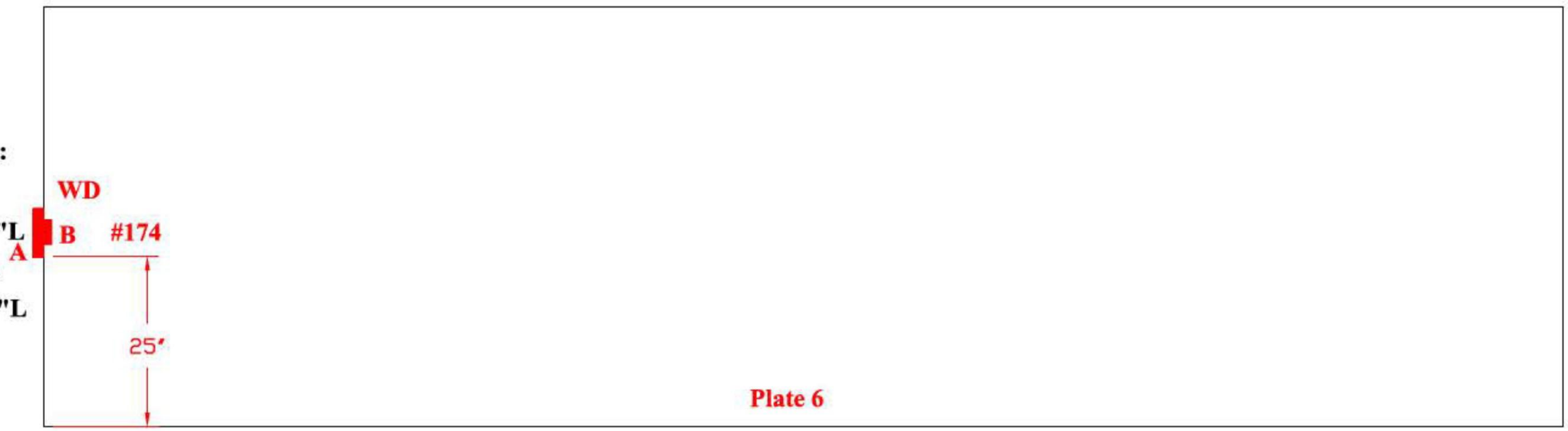
TANK # 20 - QUADRANT B

Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: B

Course: 22
Plate #: 6
Flaw # - Type - Remaining:

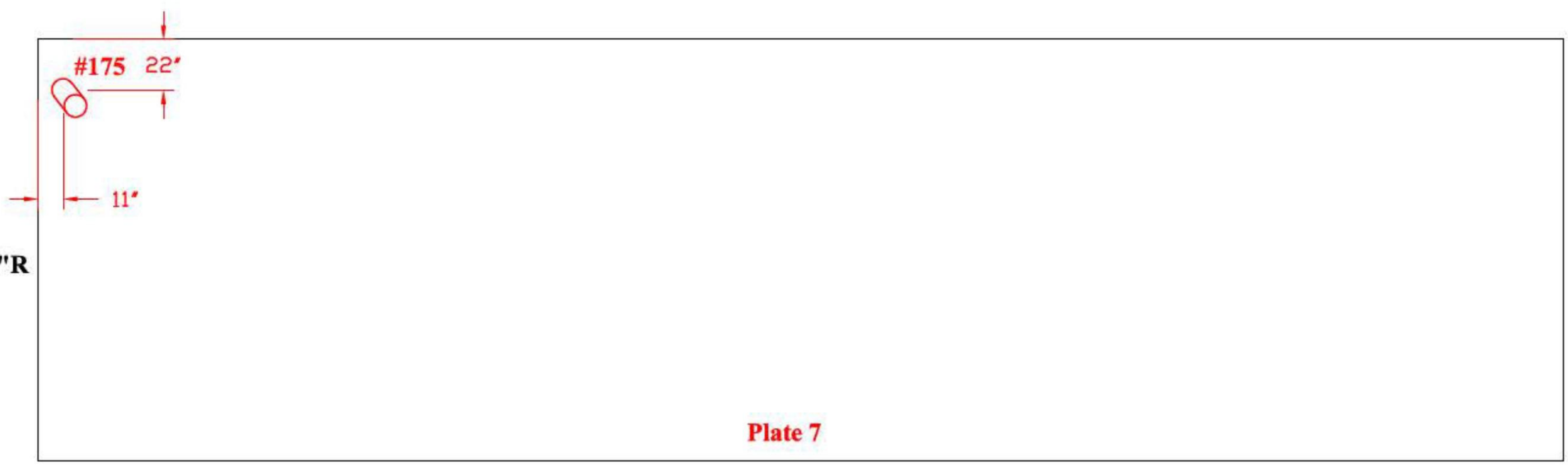
#174 - A) LOF 0.113"D 7"L
(2) Pits - 0.125" dia
B) LOF 0.121"D 2"L



Tank Section: Barrel
Quadrant: B

Course: 5
Plate #: 7
Flaw # - Type - Remaining:

#175 - Grout Nozzle - 0.230"R



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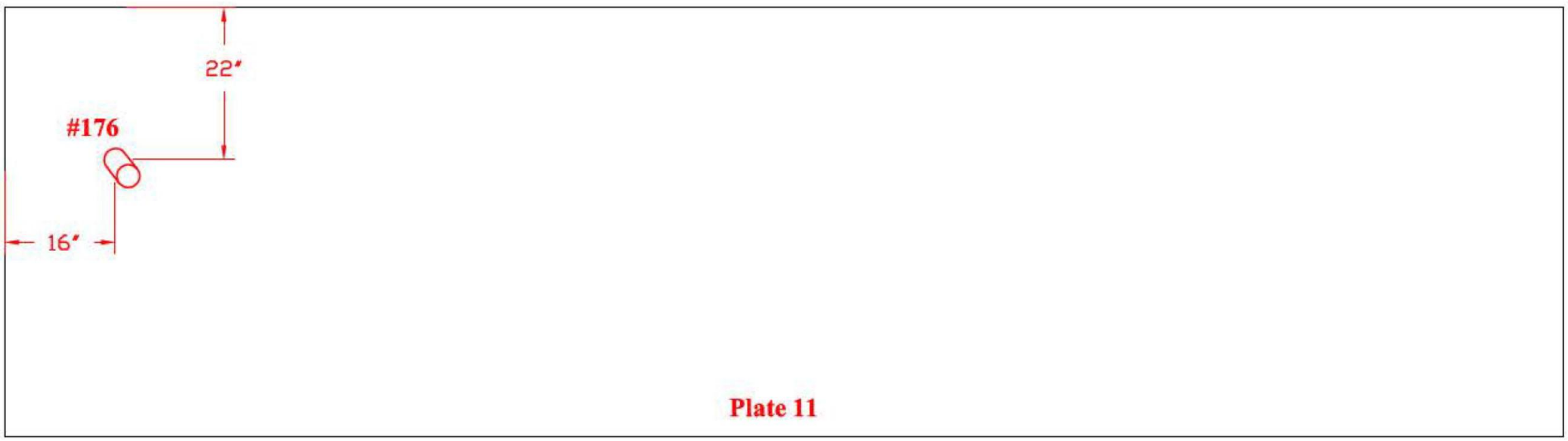
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: C

Course: 27
Plate #: 11
Flaw # - Type - Remaining:

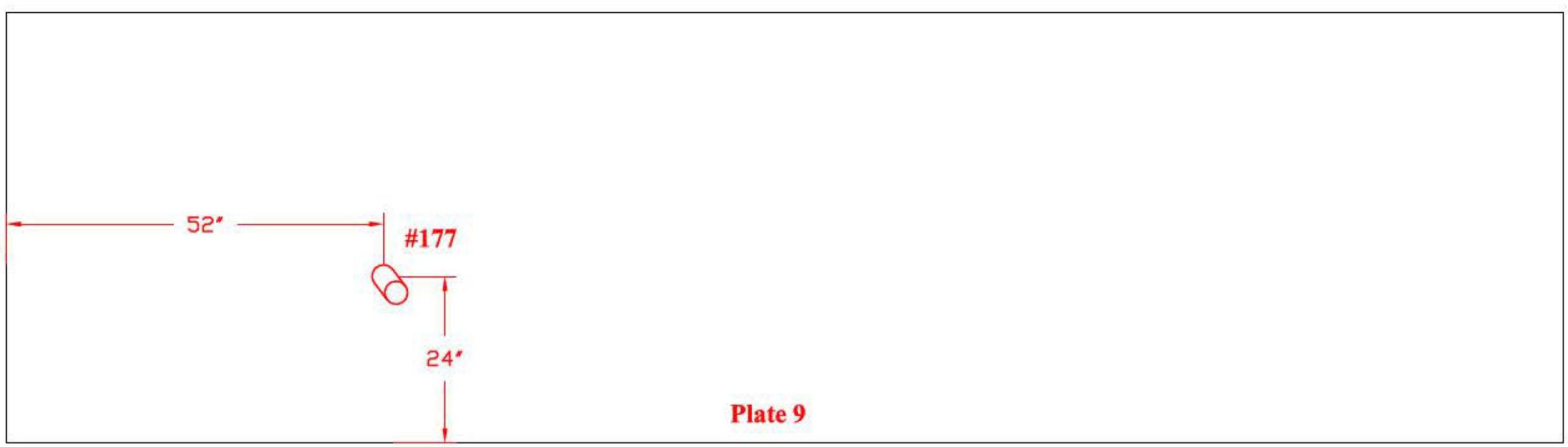
#176 - Grout Nozzle - 0.214"R



Tank Section: Barrel
Quadrant: C

Course: 12
Plate #: 9
Flaw # - Type - Remaining:

#177 - Grout Nozzle - 0.204"R



Drawing is not to scale

TesTex
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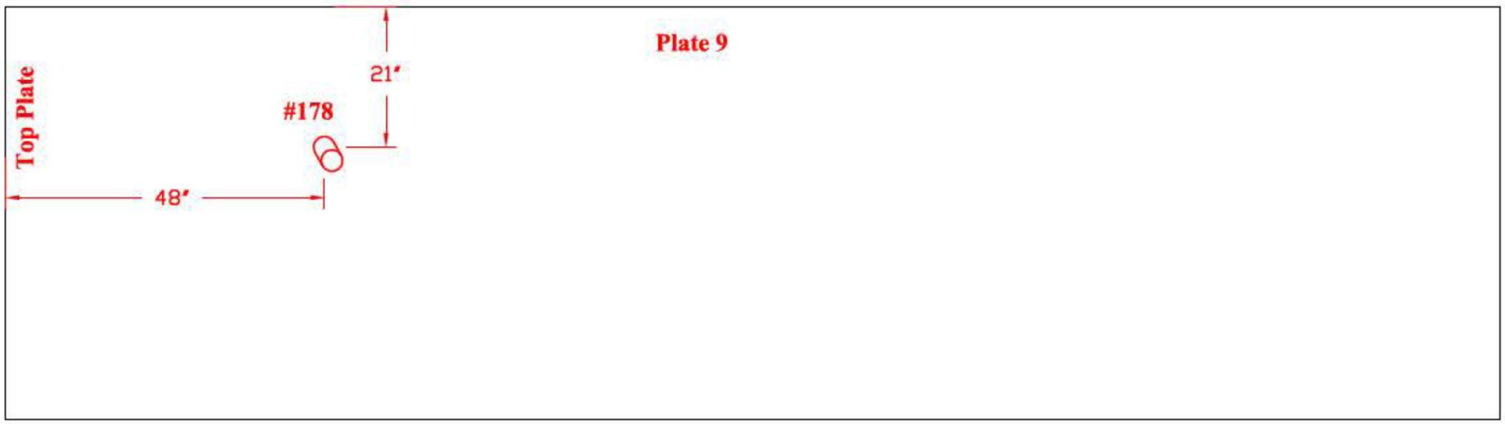
TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

Tank Section: Barrel
Quadrant: C

Course: 1
Plate #: 9

Flaw # - Type - Remaining:

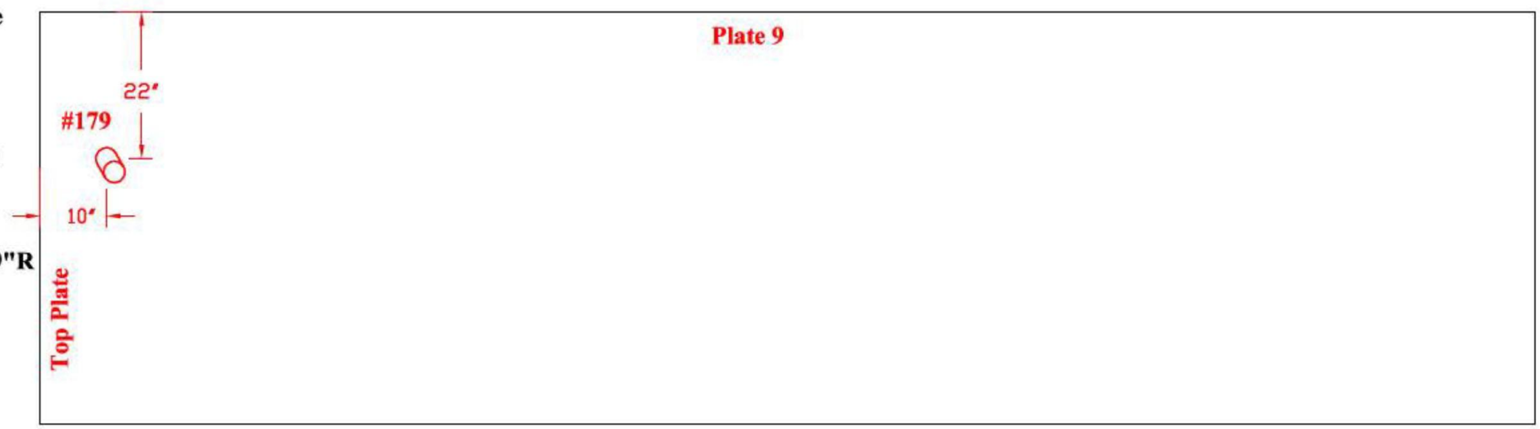
#178 - Grout Nozzle - 0.211"R



Tank Section: Lower Dome
Quadrant: C

Course: 5
Plate #: 9
Flaw # - Type - Remaining:

#179 - Grout Nozzle - 0.209"R



Drawing is not to scale

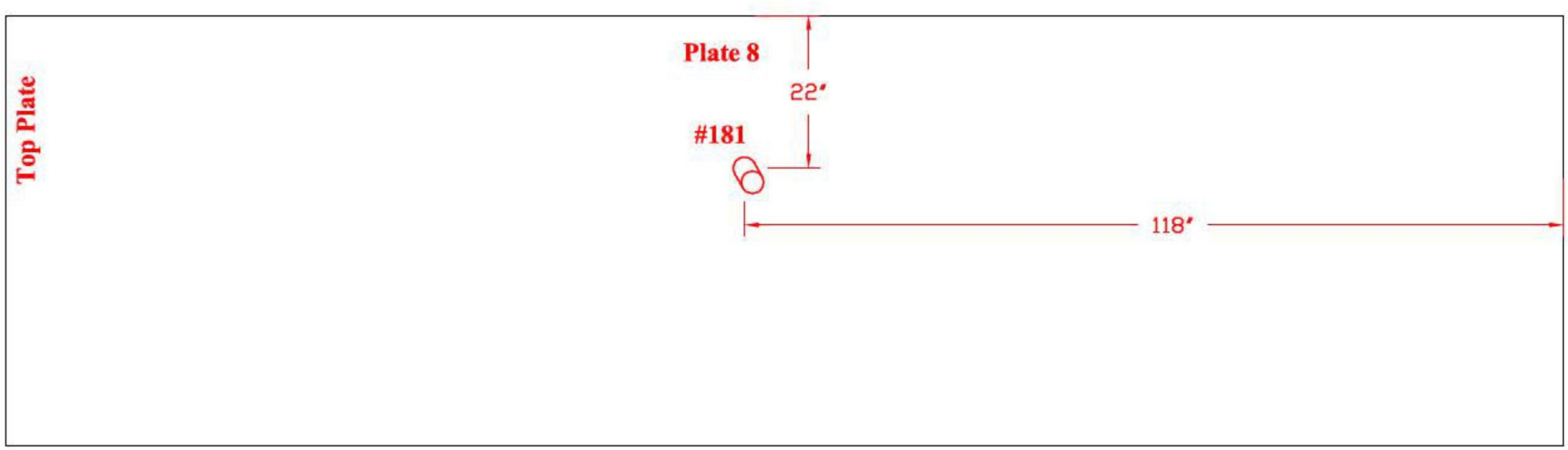
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: C

Course: 12
Plate #: 8

Flaw # - Type - Remaining:

#181 - Grout Nozzle - 0.222"R



Tank Section: Barrel
Quadrant: C

Course: 19
Plate #: 9A

Flaw # - Type - Remaining:

#182 - Grout Nozzle - 0.213"R

Drawing is not to scale

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TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

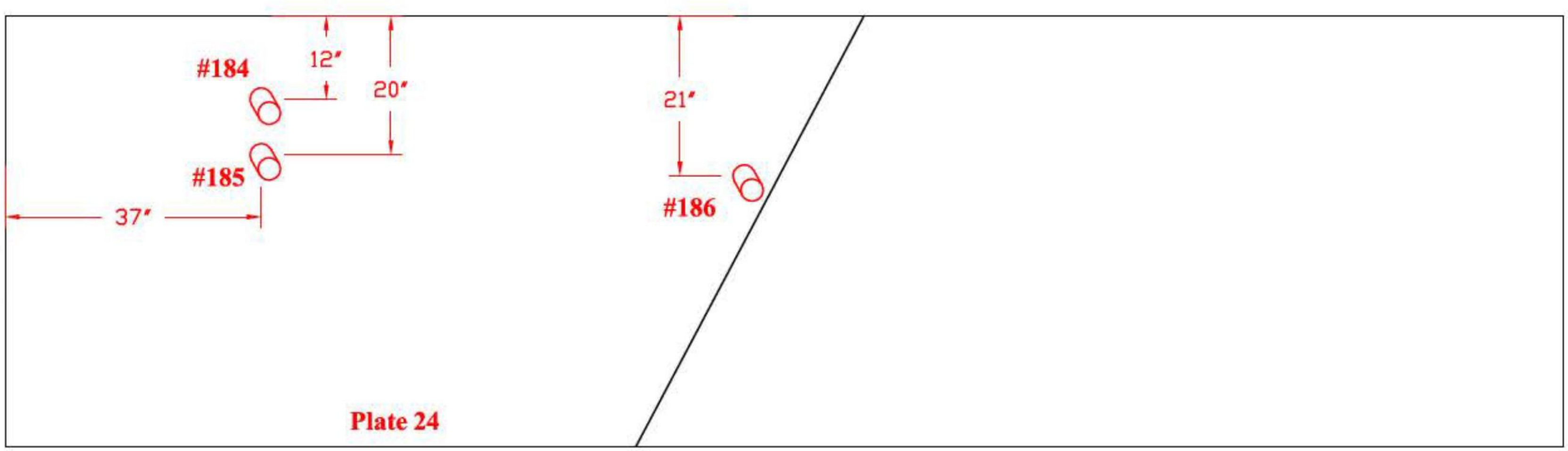
Course: 2
Plate #: 24

Flaw # - Type - Remaining:

#184 - Grout Nozzle - 0.207"R

#185 - Grout Nozzle - 0.208"R

#186 - Grout Nozzle - 0.220"R



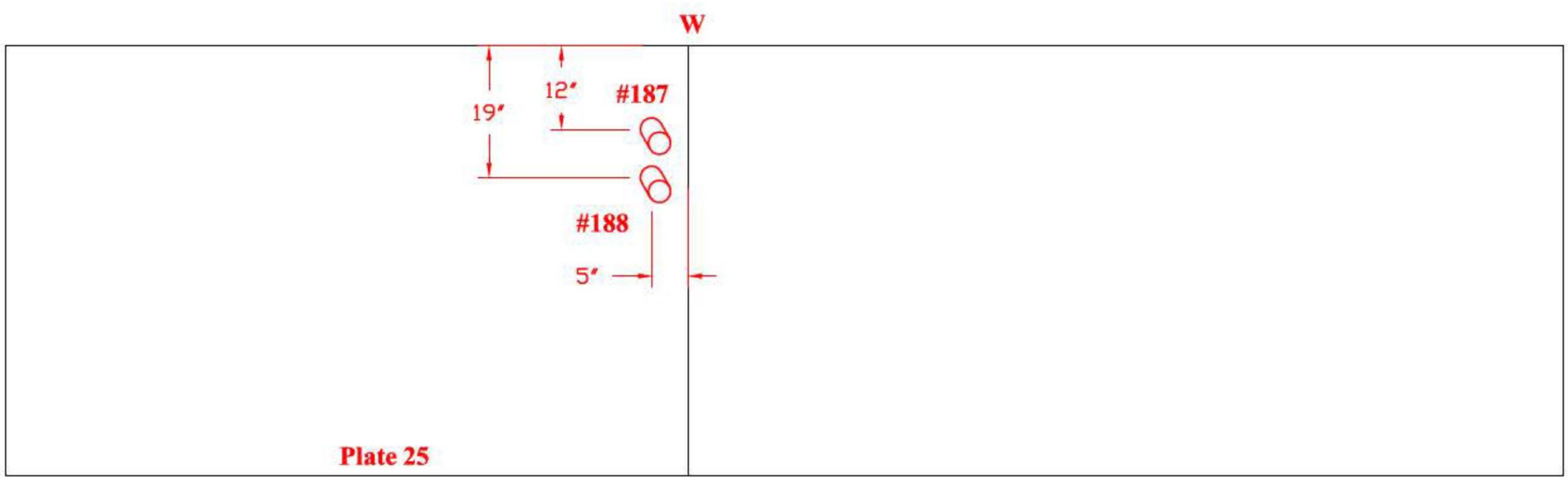
Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 25

Flaw # - Type - Remaining:

#187 - Grout Nozzle - 0.227"R

#188 - Grout Nozzle - 0.223"R



Drawing is not to scale

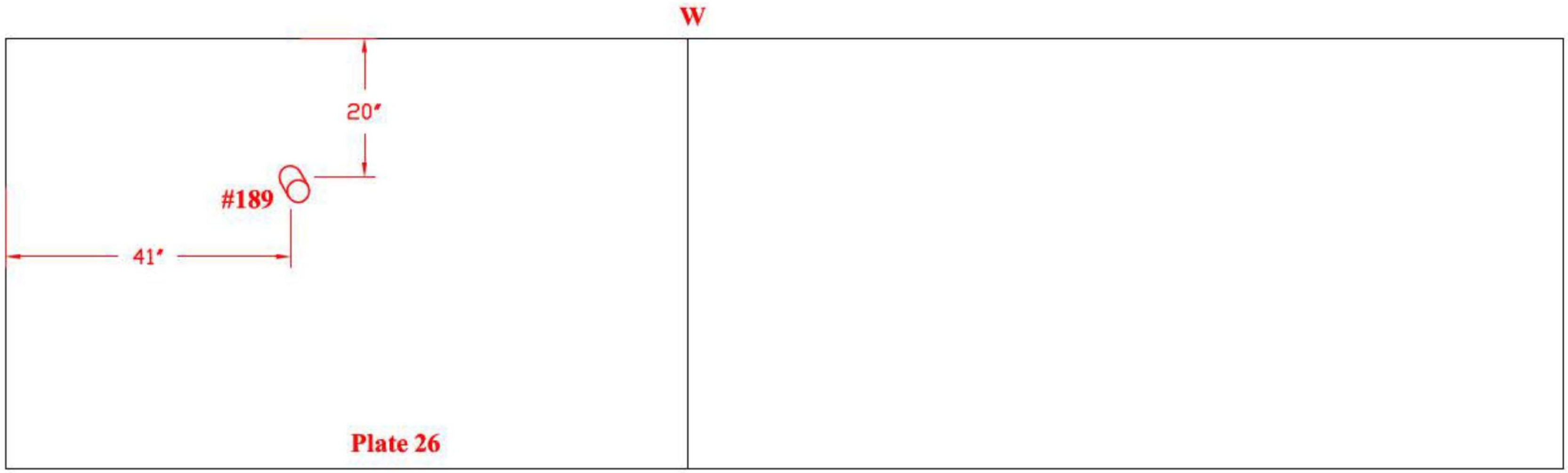
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 26

Flaw # - Type - Remaining:

#189 - Grout Nozzle - 0.200"R



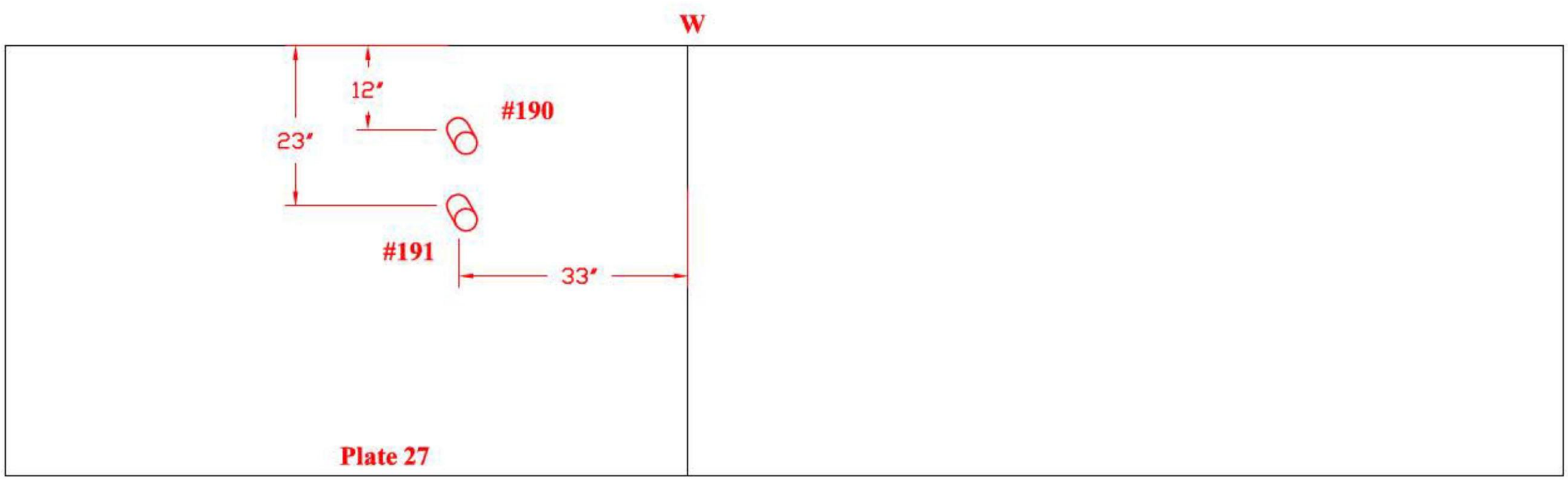
Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 27

Flaw # - Type - Remaining:

#190 - Grout Nozzle - 0.208"R

#191 - Grout Nozzle - 0.217"R



Drawing is not to scale

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TANK # 20 - QUADRANT C

Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

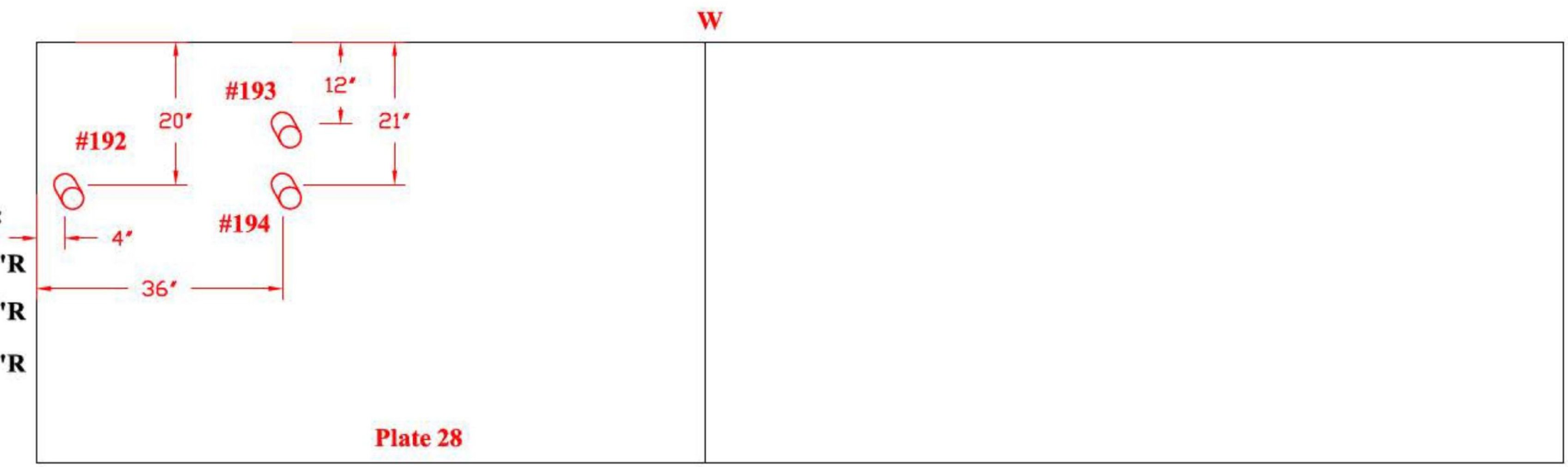
Course: 2
Plate #: 28

Flaw # - Type - Remaining:

#192 - Grout Nozzle - 0.199"R

#193 - Grout Nozzle - 0.200"R

#194 - Grout Nozzle - 0.217"R

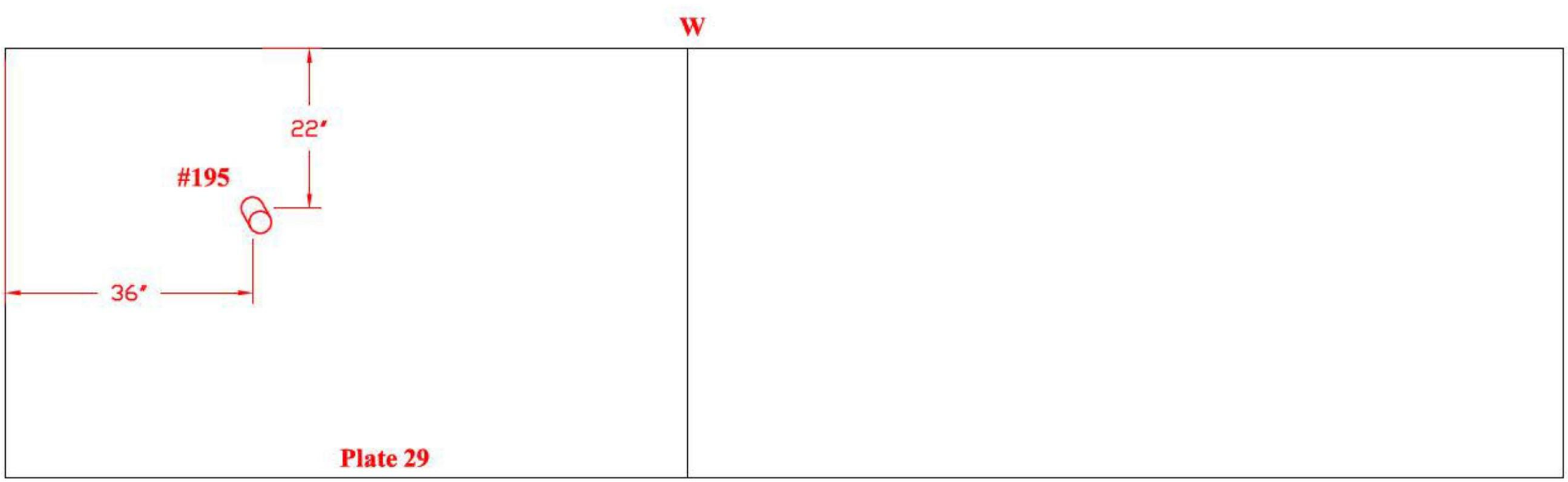


Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 29

Flaw # - Type - Remaining:

#195 - Grout Nozzle - 0.210"R



Drawing is not to scale

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TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

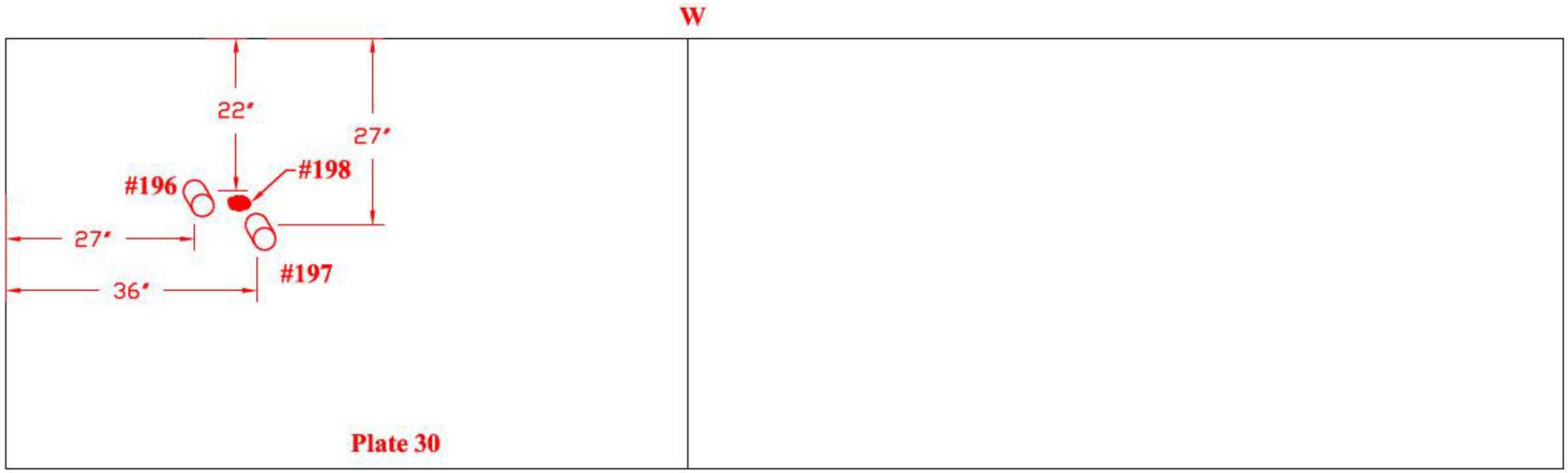
Course: 2
Plate #: 30

Flaw # - Type - Remaining:

#196 - Grout Nozzle - 0.200"R

#197 - Grout Nozzle - 0.192"R

#198 - Dent - 0.200" deep



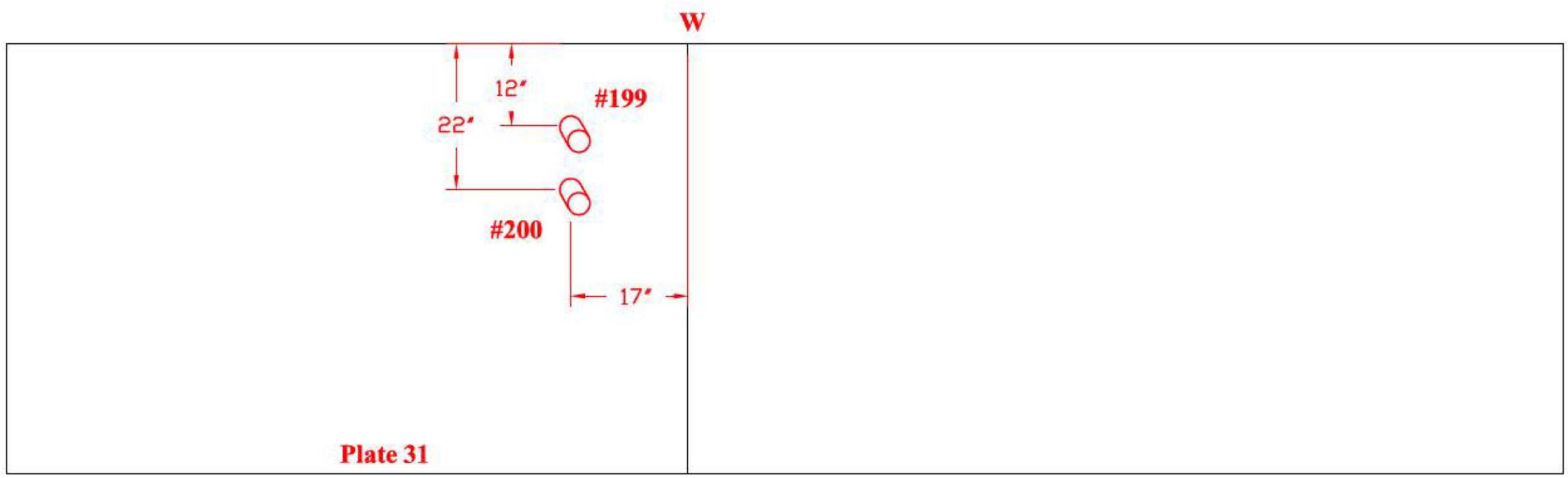
Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 31

Flaw # - Type - Remaining:

#199 - Grout Nozzle - 0.219"R

#200 - Grout Nozzle - 0.204"R



Drawing is not to scale

TesTex
WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT C

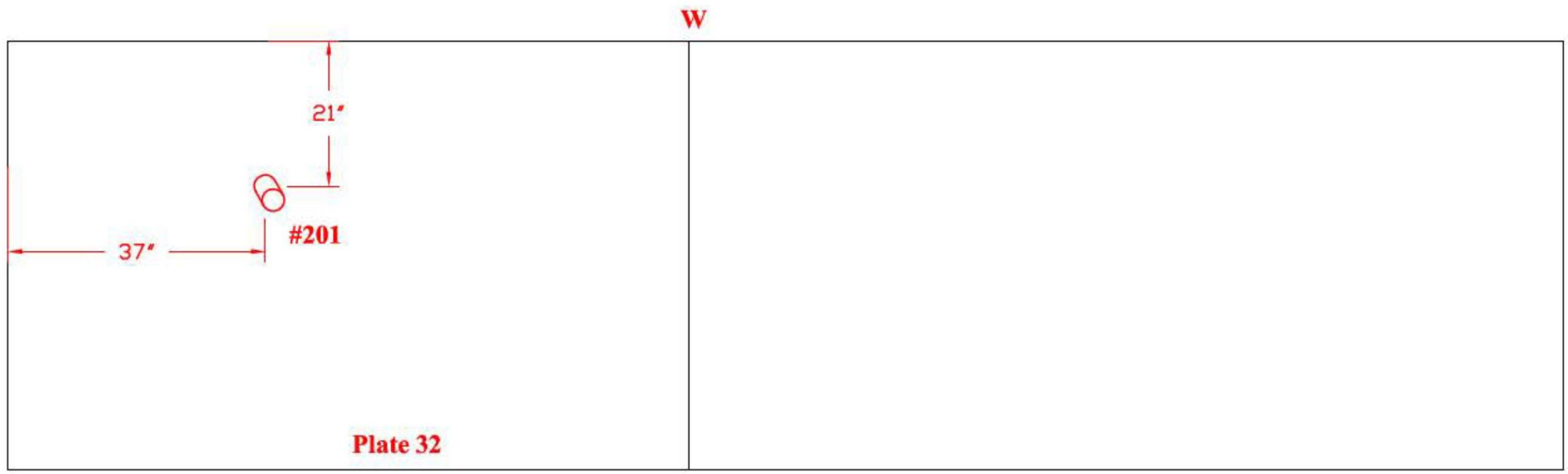
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 32

Flaw # - Type - Remaining:

#201 - Grout Nozzle - 0.211"R



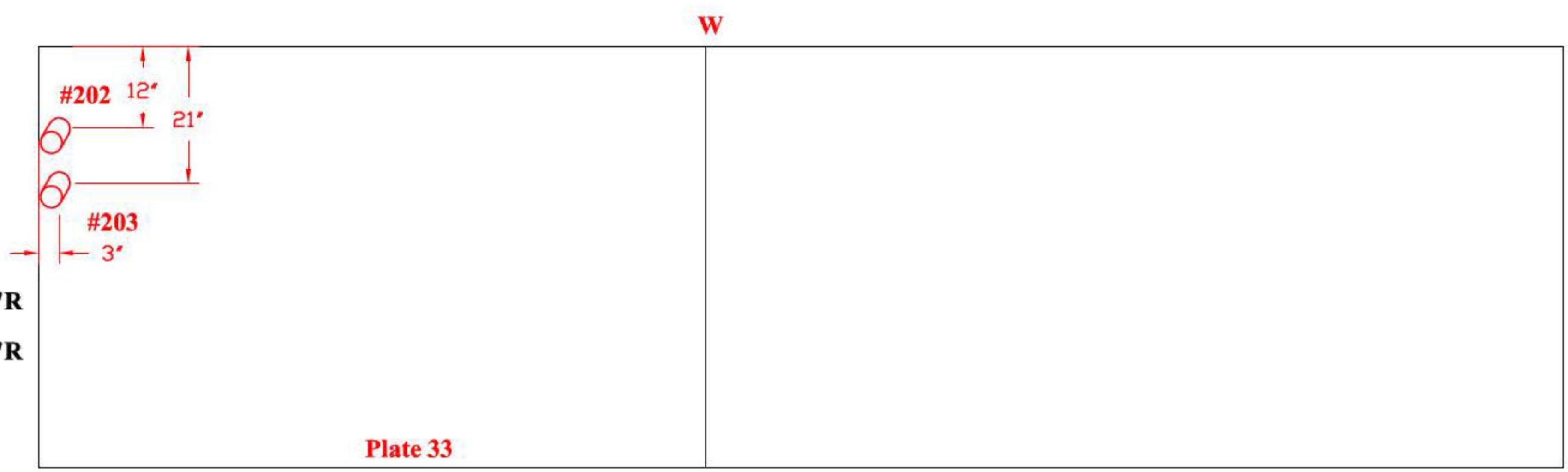
Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 33

Flaw # - Type - Remaining:

#202 - Grout Nozzle - 0.211"R

#203 - Grout Nozzle - 0.211"R



Drawing is not to scale

TesTex
WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

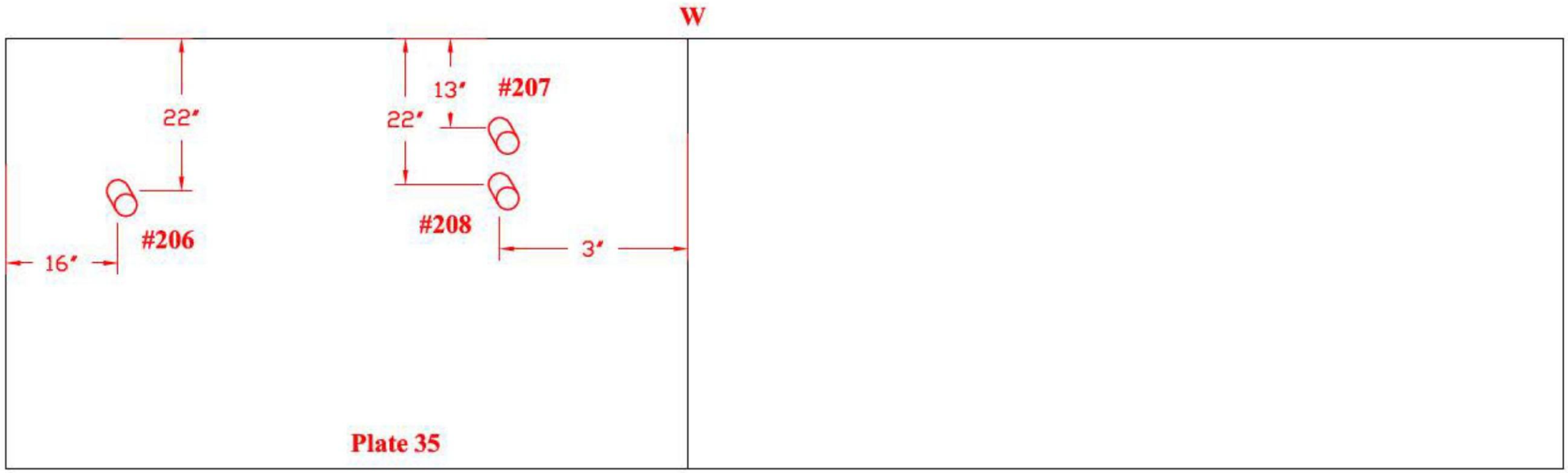
Course: 2
Plate #: 35

Flaw # - Type - Remaining:

#206 - Grout Nozzle - 0.195"R

#207 - Grout Nozzle - 0.205"R

#208 - Grout Nozzle - 0.213"R



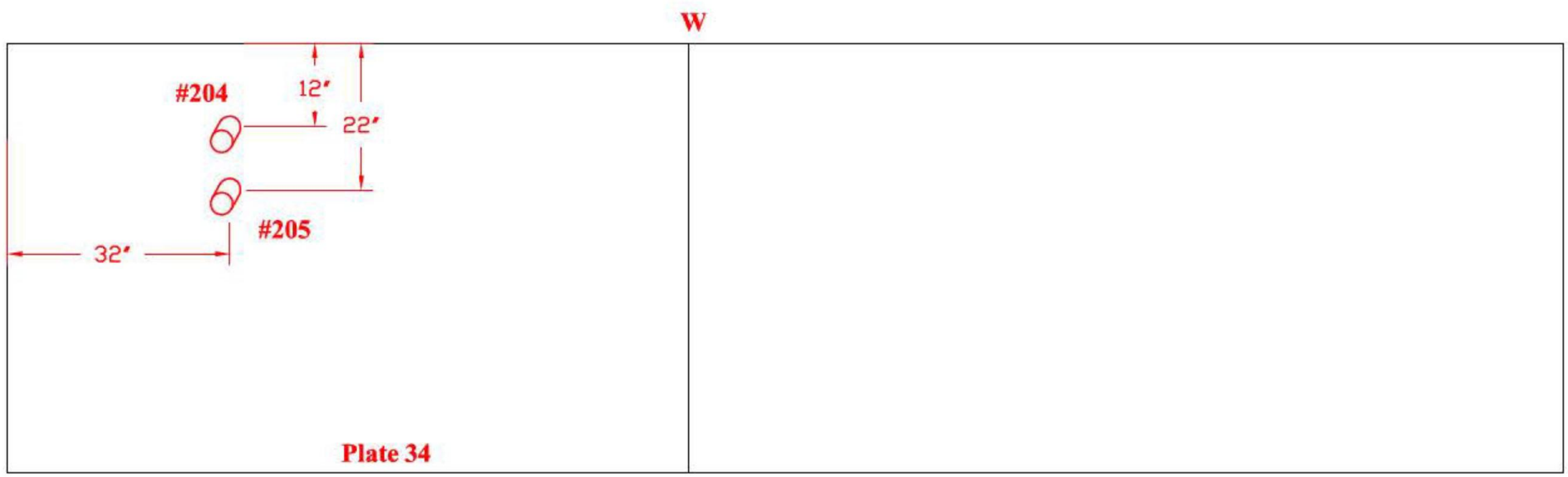
Tank Section: Extension
Quadrant: C

Course: 2
Plate #: 34

Flaw # - Type - Remaining:

#204 - Grout Nozzle - 0.214"R

#205 - Grout Nozzle - 0.210"R



Drawing is not to scale

TesTex
WWW.TESTEX-NDT.COM

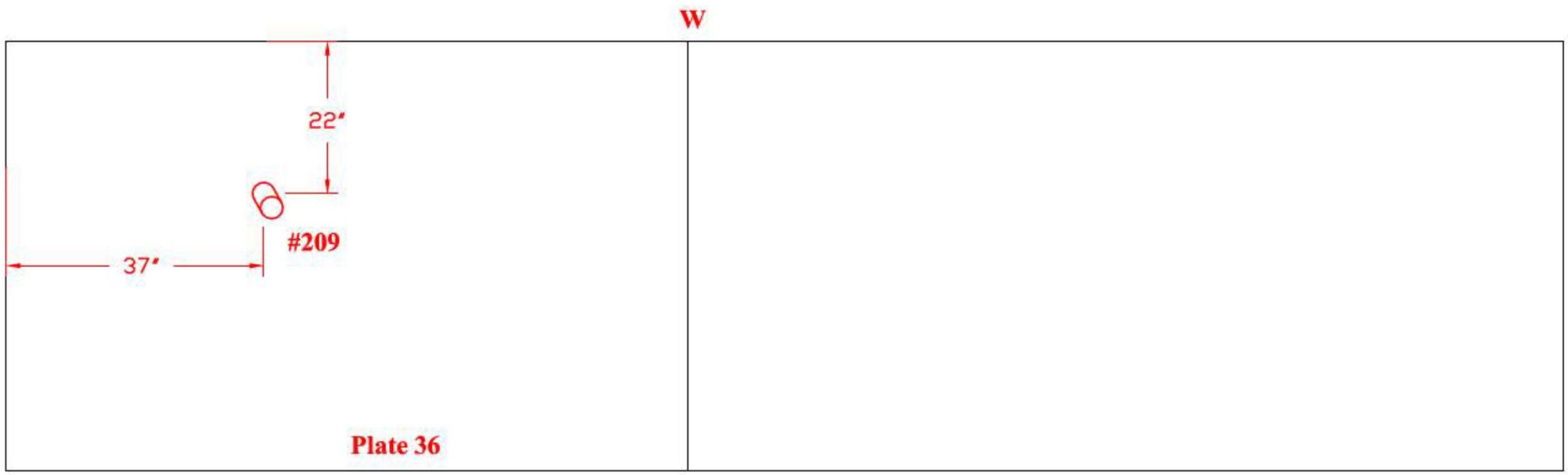
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 36

Flaw # - Type - Remaining:

#209 - Grout Nozzle - 0.193"R



Tank Section: Extension
Quadrant: D

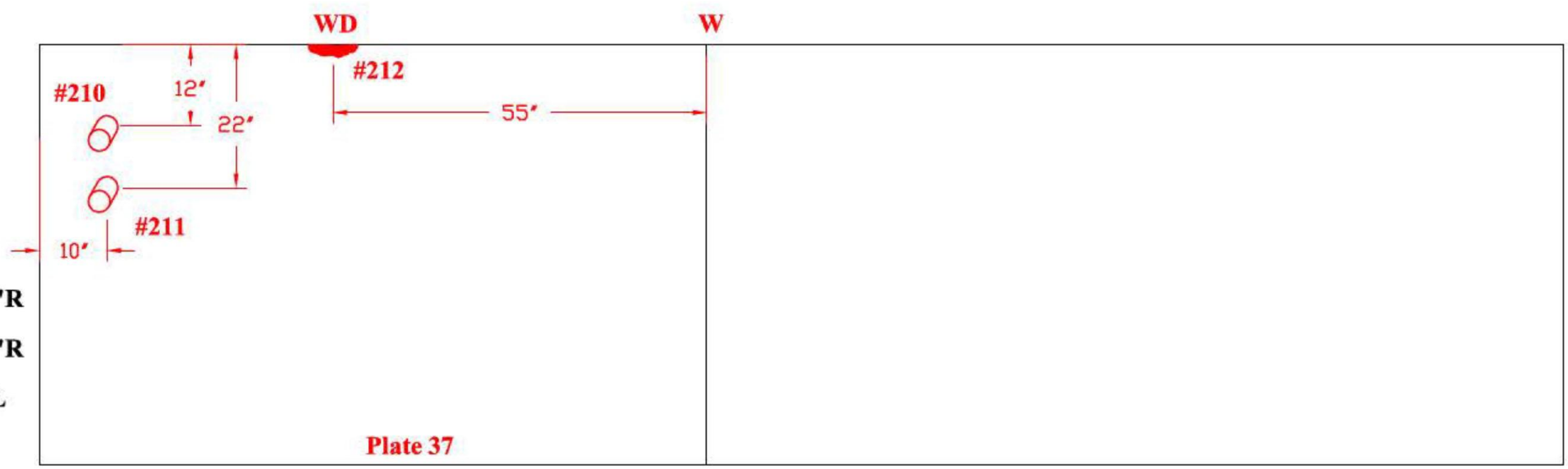
Course: 2
Plate #: 37

Flaw # - Type - Remaining:

#210 - Grout Nozzle - 0.213"R

#211 - Grout Nozzle - 0.200"R

#212 - LOF - 0.098"D 4.5"L



Drawing is not to scale

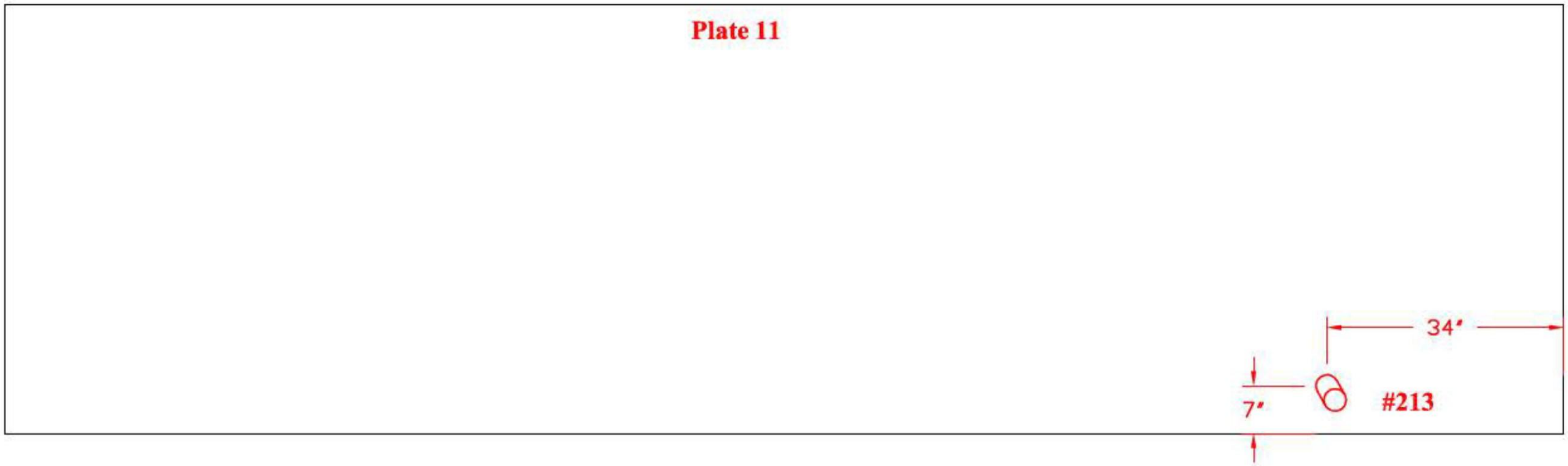
TANK # 20 - QUADRANT B AND C
***Nominal Plate Thickness: 0.250"**

Tank Section: Extension
Quadrant: B

Course: 1
Plate #: 11

Flaw # - Type - Remaining:

#213 - Grout Nozzle - 0.205"R

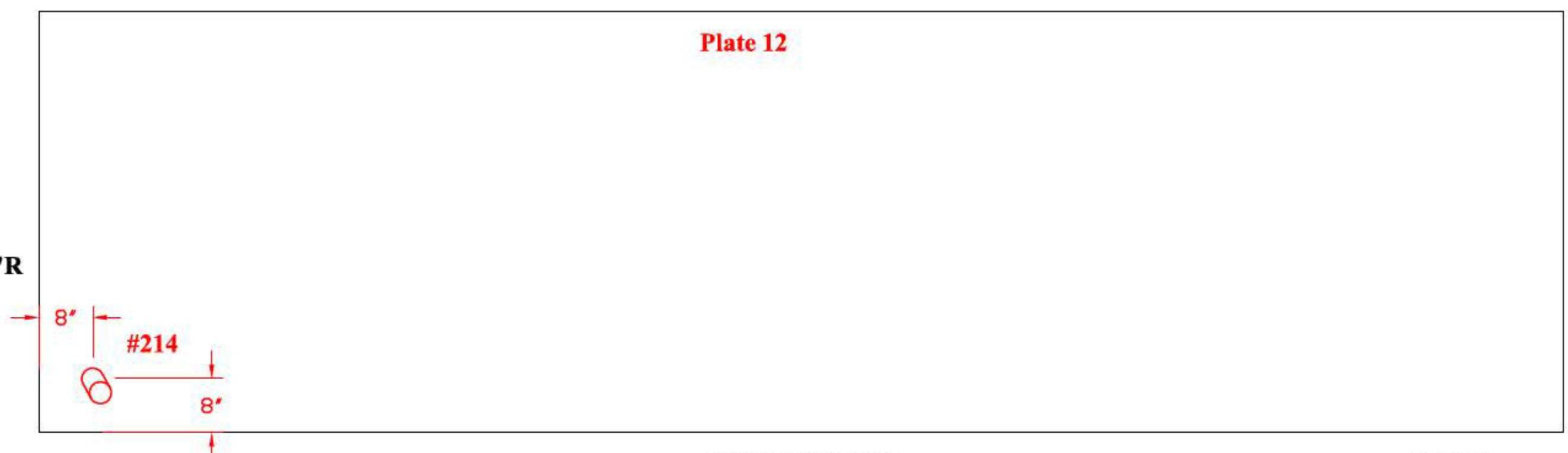


Tank Section: Extension
Quadrant: C

Course: 1
Plate #: 12

Flaw # - Type - Remaining:

#214 - Grout Nozzle - 0.207"R



Drawing is not to scale

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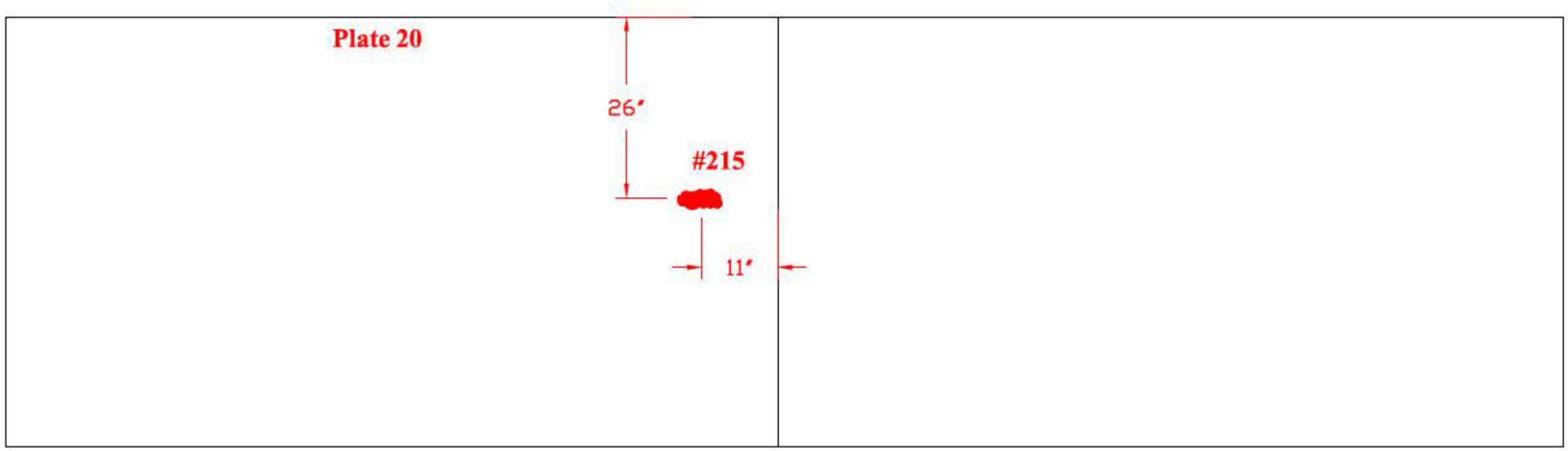
TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

Tank Section: Extension
Quadrant: C

Course: 3
Plate #: 20

Flaw # - Type - Remaining:

#215 - Gouge - 0.160" deep

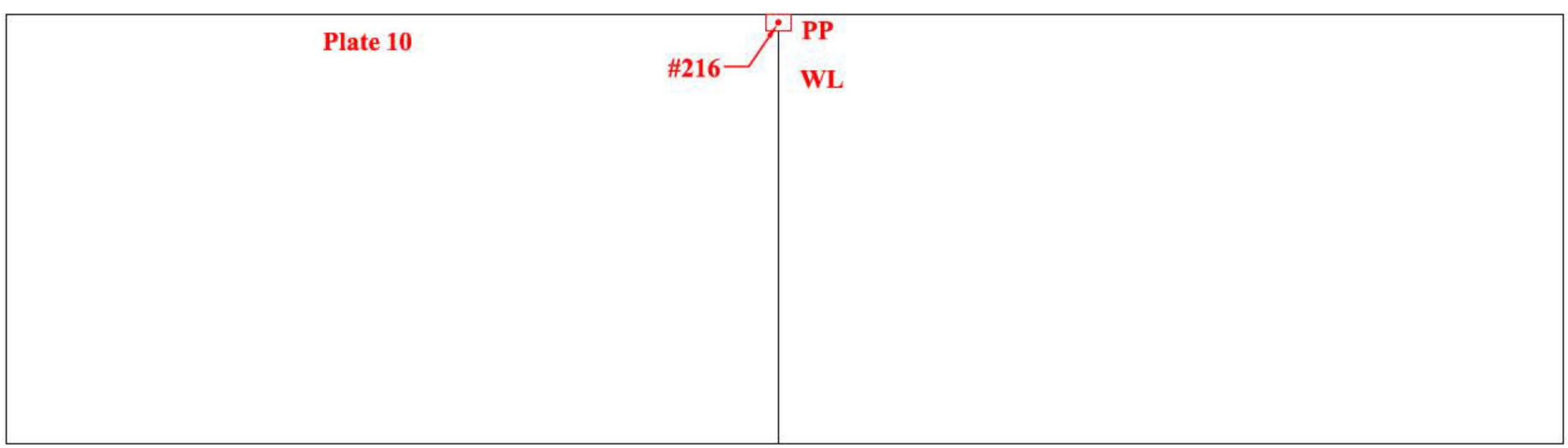


Tank Section: Extension
Quadrant: C

Course: 4
Plate #: 10

Flaw # - Type - Remaining:

#216 - WL - PP - 0.230"R



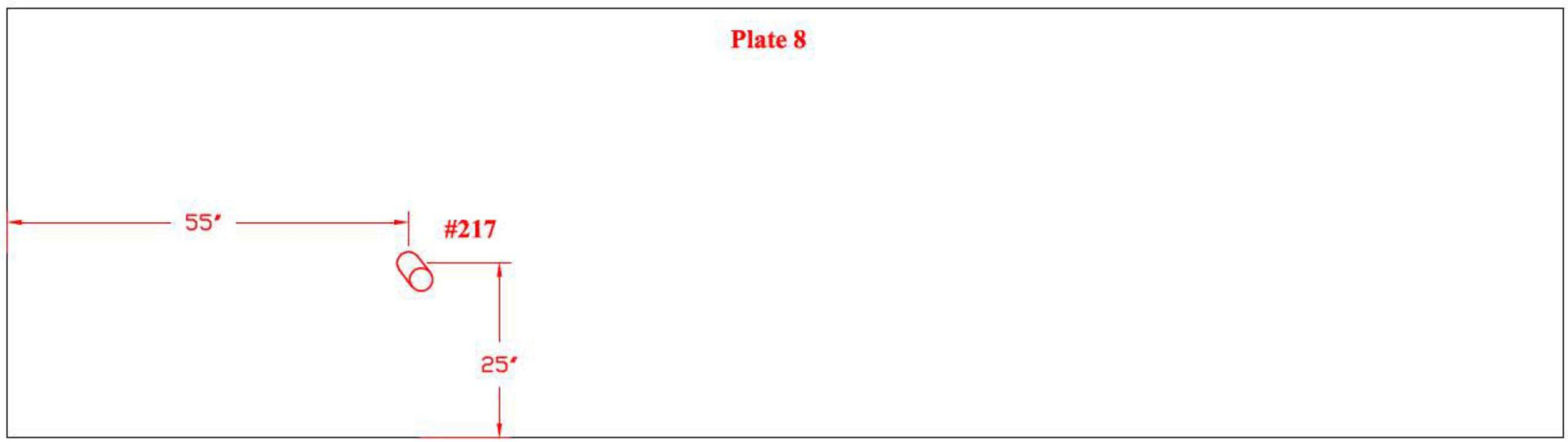
Drawing is not to scale

TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: B

Course: 5
Plate #: 8
Flaw # - Type - Remaining:

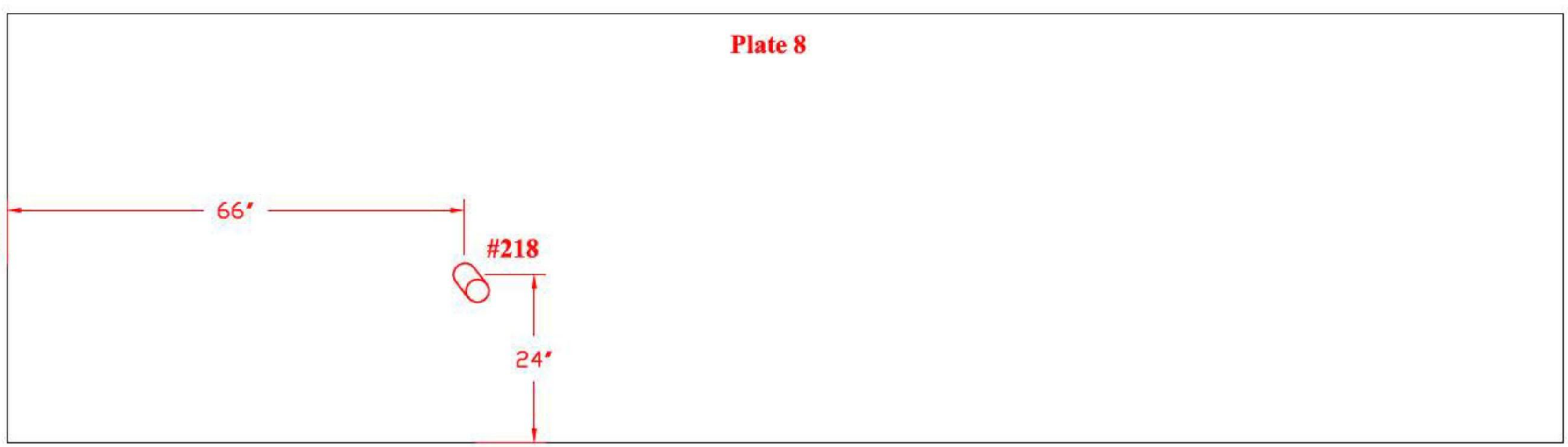
#217 - Grout Nozzle - 0.194"R



Tank Section: Barrel
Quadrant: B

Course: 19
Plate #: 8
Flaw # - Type - Remaining:

#218 - Grout Nozzle - 0.230"R



Drawing is not to scale

TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

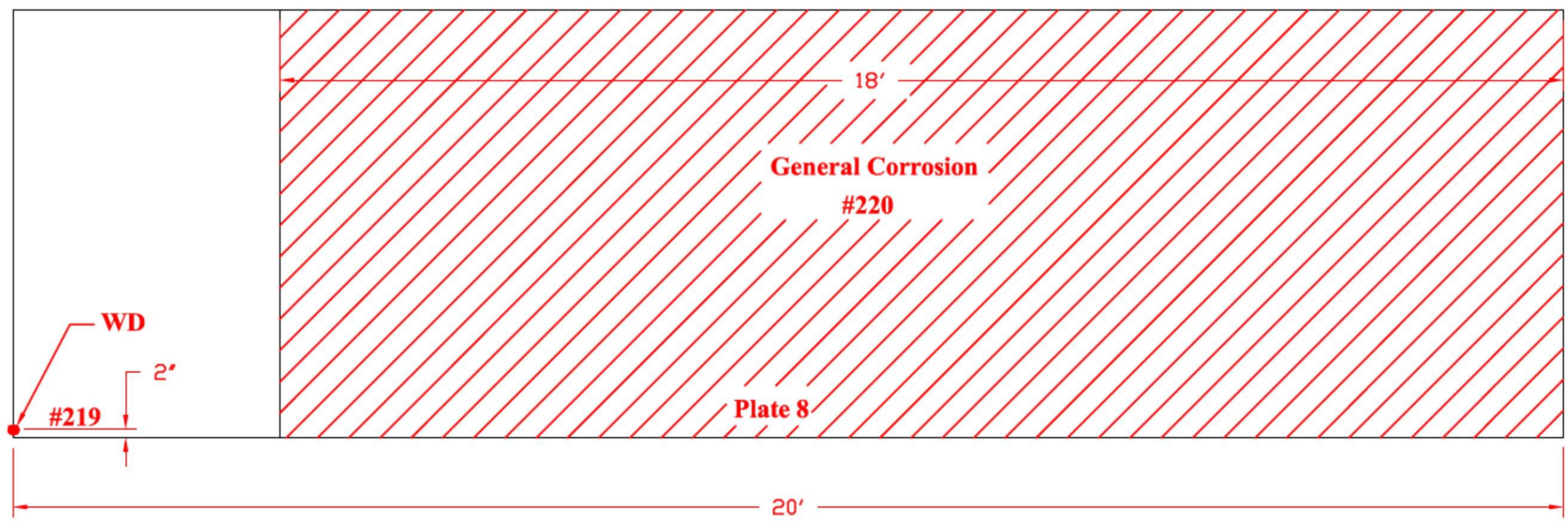
Tank Section: Barrel
Quadrant: B

Course: 27
Plate #: 8
Flaw # - Type - Remaining:

#219 - LOF 0.131"D 1.5"L

- LOF 0.137"D 2"L

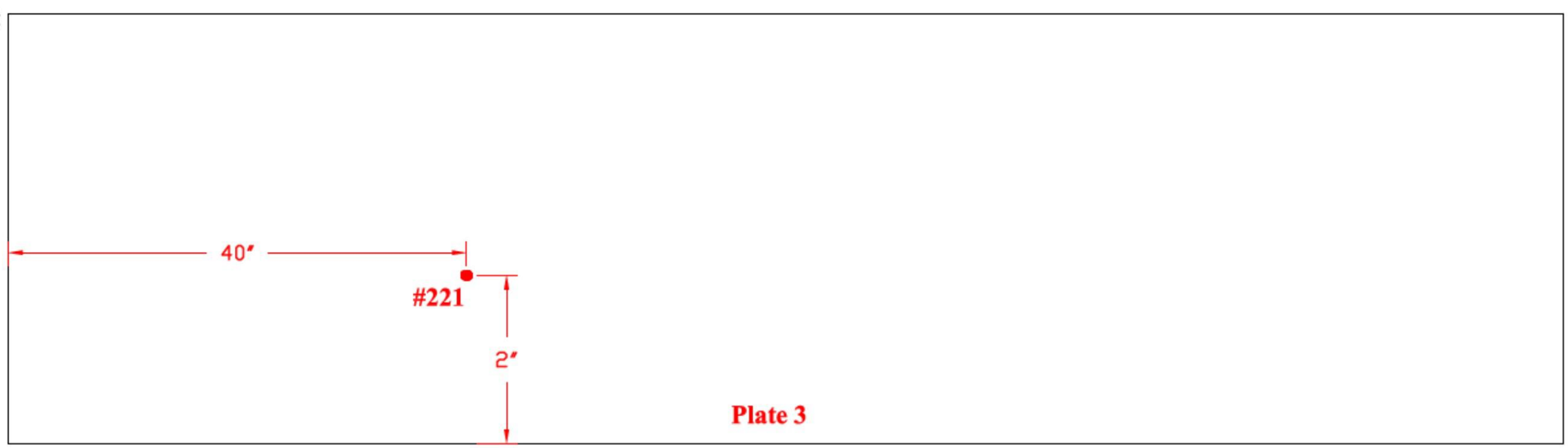
#220 - WL - 0.230"R



Tank Section: Expansion Joint
Quadrant: A

Course: 2
Plate #: 3
Flaw # - Type - Remaining:

#221 - Gouge - 0.210"Deep



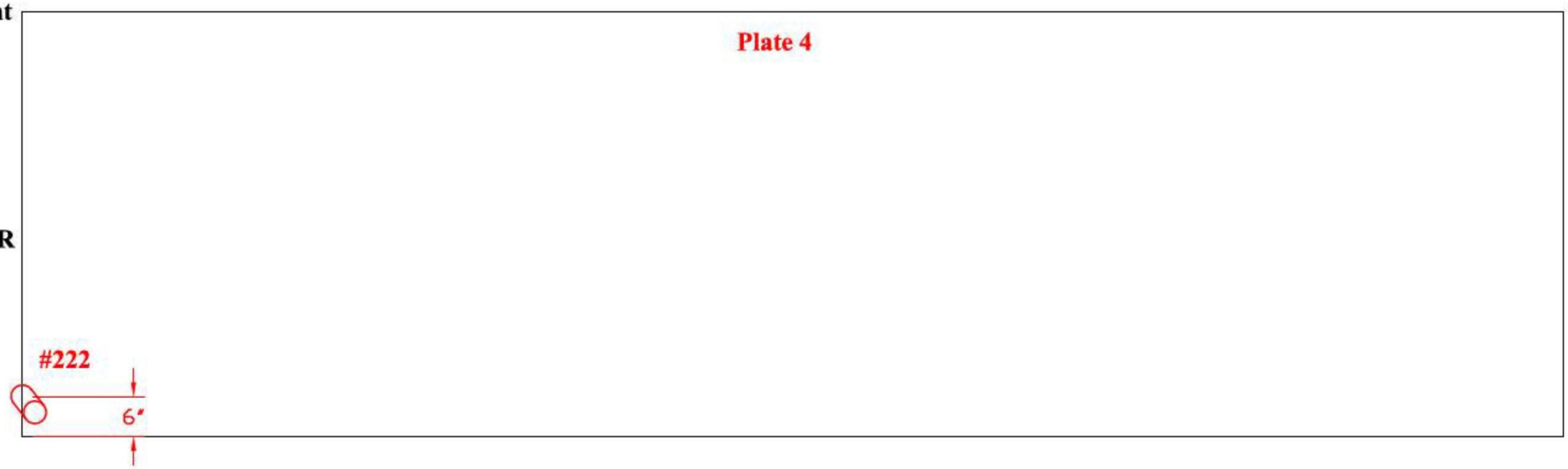
Drawing is not to scale

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Expansion Joint
Quadrant: A

Course: 1
Plate #: 4
Flaw # - Type - Remaining:

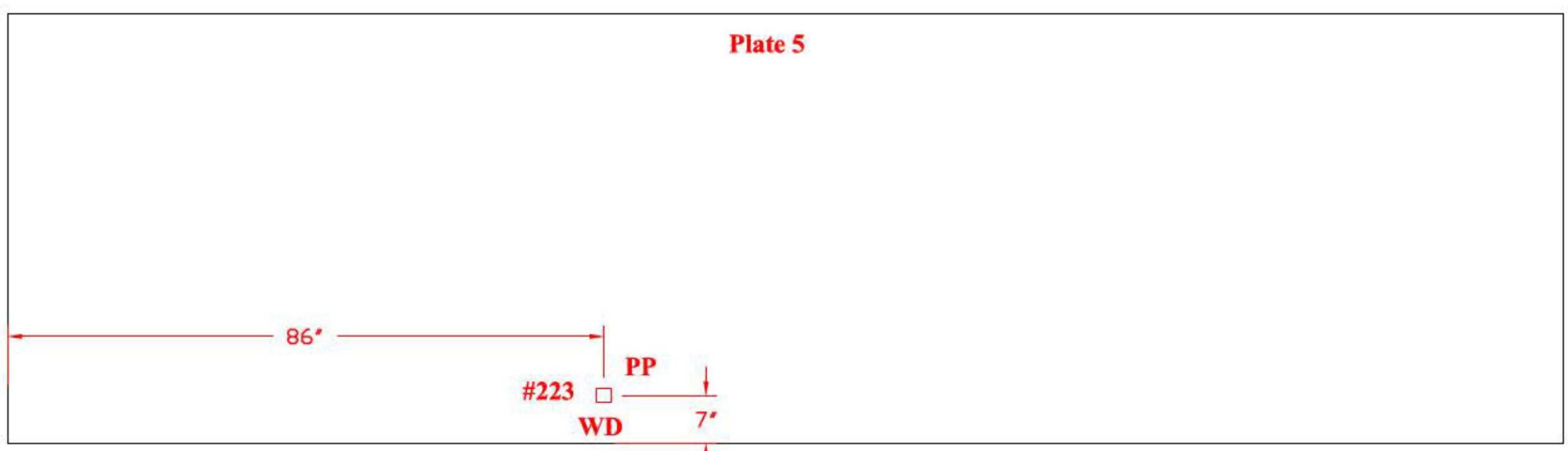
#222 - Grout Nozzle - 0.230"R



Tank Section: Expansion Joint
Quadrant: A

Course: 1
Plate #: 5
Flaw # - Type - Remaining:

#223 - PP - 0.230"R



Drawing is not to scale

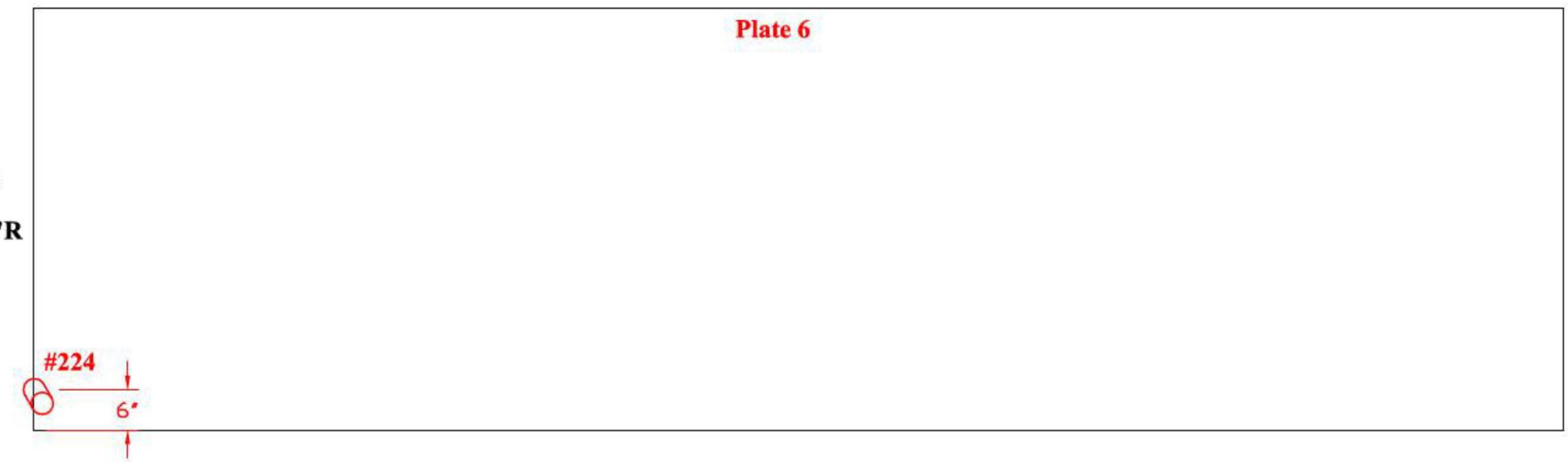
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: B

Course: 1
Plate #: 6

Flaw # - Type - Remaining:

#224 - Grout Nozzle - 0.236"R

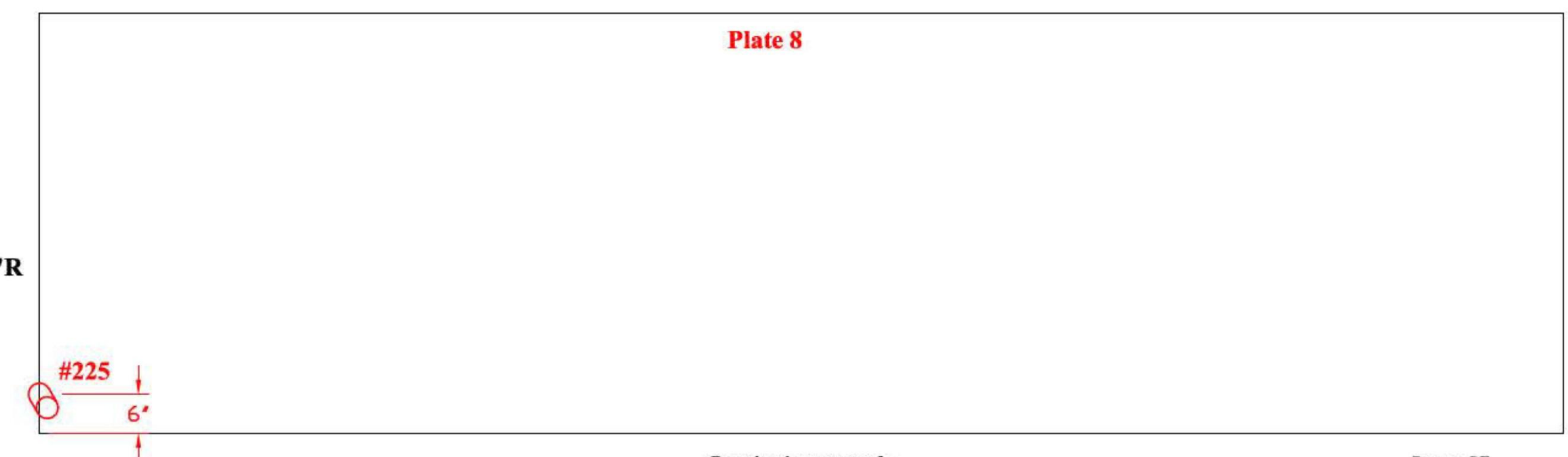


Tank Section: Extension
Quadrant: B

Course: 1
Plate #: 8

Flaw # - Type - Remaining:

#225 - Grout Nozzle - 0.232"R



Drawing is not to scale

TANK # 20 - QUADRANT B

**Nominal Plate Thickness: 0.250"*

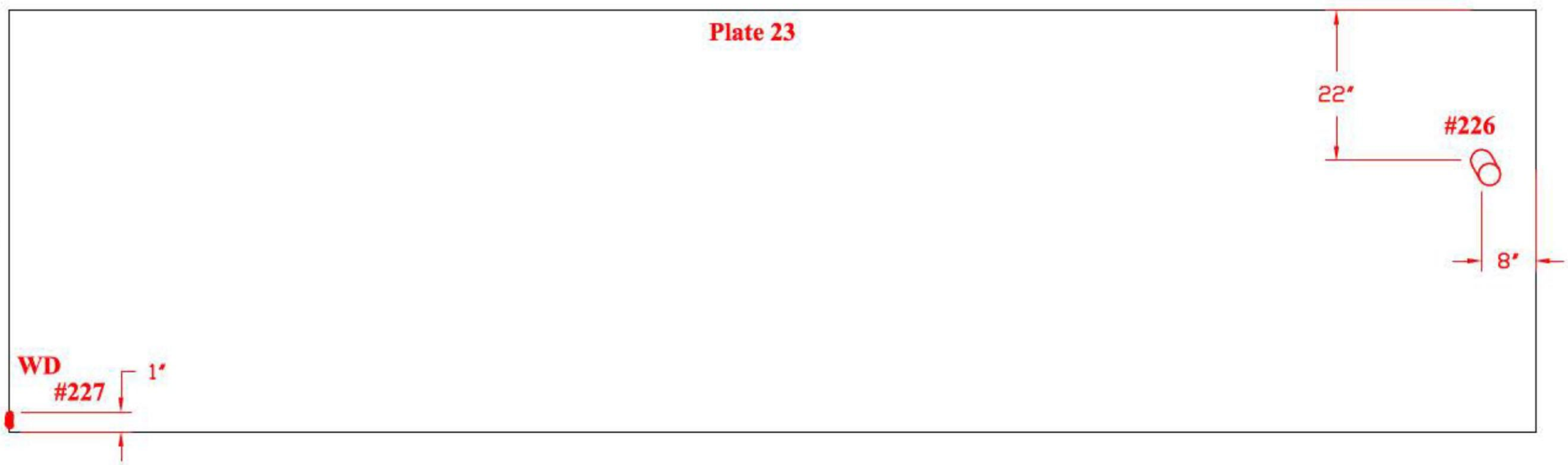
Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 23

Flaw # - Type - Remaining:

#226 - Grout Nozzle - 0.208"R

#227 - WG - 0.127"D 1.75"L



Tank Section: Extension
Quadrant: B

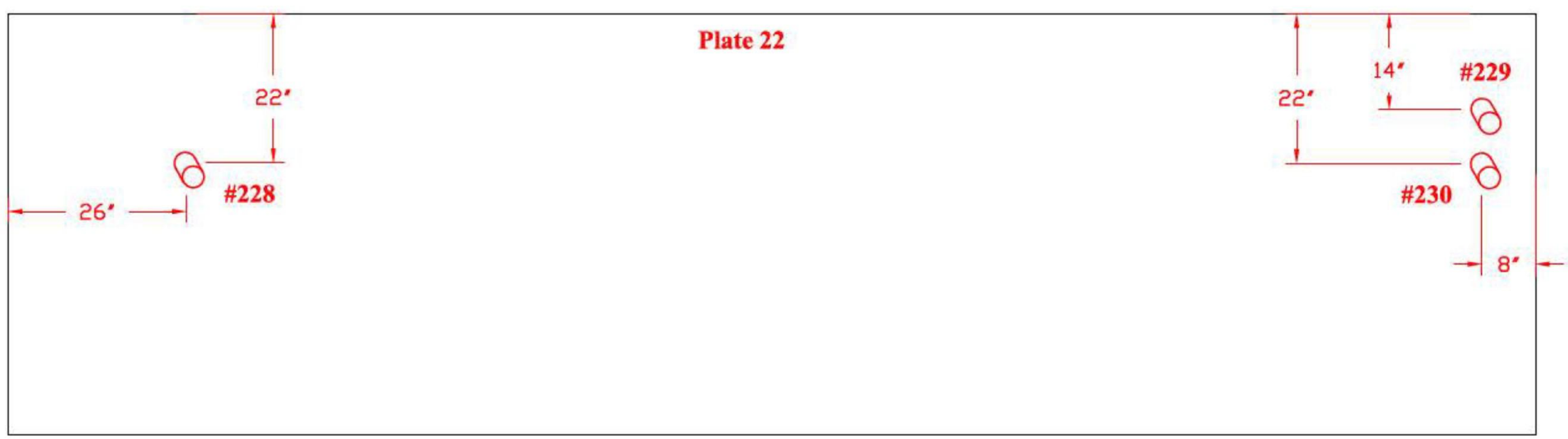
Course: 2
Plate #: 22

Flaw # - Type - Remaining:

#228 - Grout Nozzle - 0.209"R

#229 - Grout Nozzle - 0.229"R

#230 - Grout Nozzle - 0.236"R



Drawing is not to scale

TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

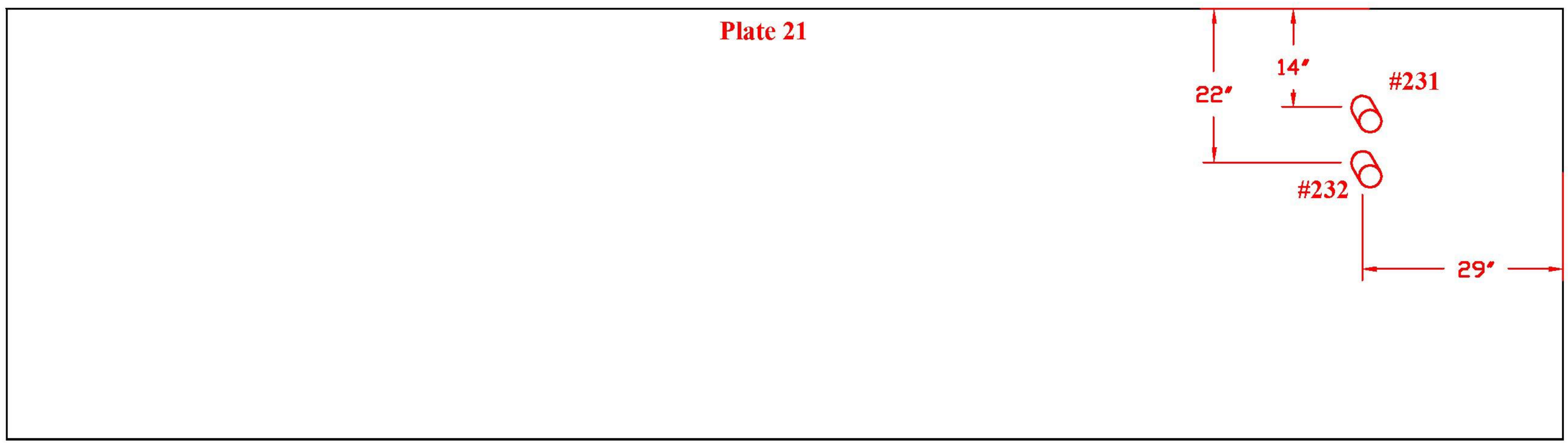
Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 21

Flaw # - Type - Remaining:

#231 - Grout Nozzle - 0.226"R

#232 - Grout Nozzle - 0.219"R



Tank Section: Extension
Quadrant: B

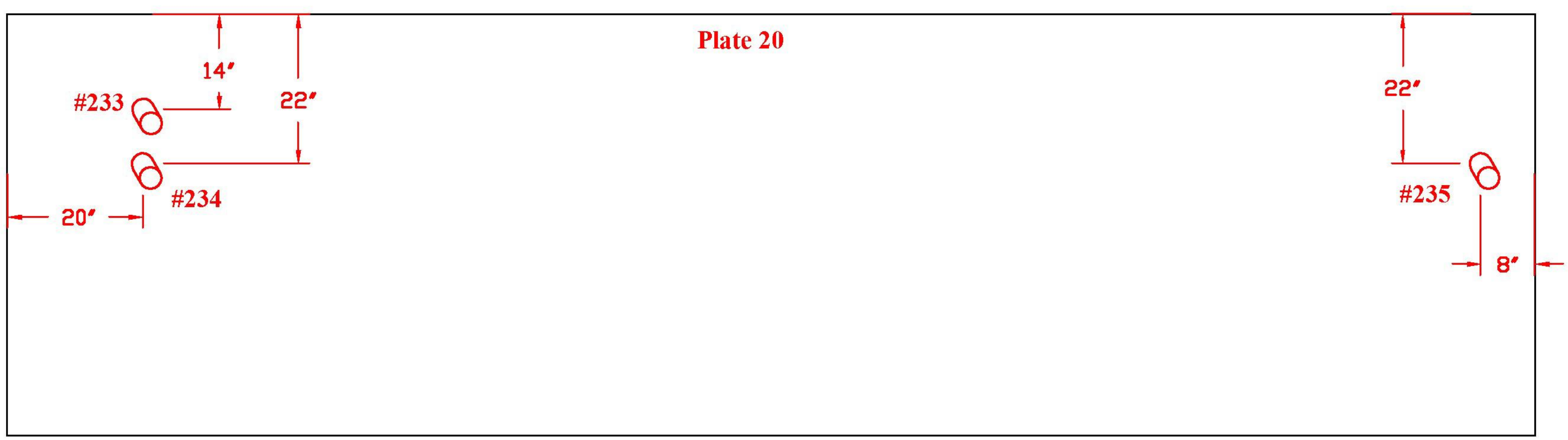
Course: 2
Plate #: 20

Flaw # - Type - Remaining:

#233 - Grout Nozzle - 0.224"R

#234 - Grout Nozzle - 0.240"R

#235 - Grout Nozzle - 0.219"R



Drawing is not to scale

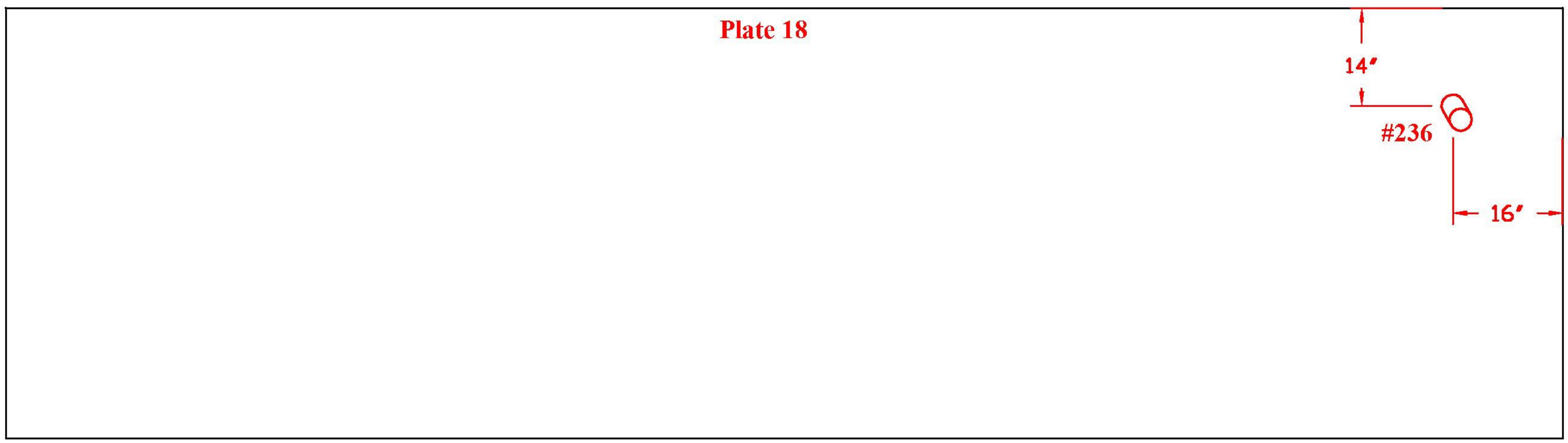
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 18

Flaw # - Type - Remaining:

#236 - Grout Nozzle - 0.209"R

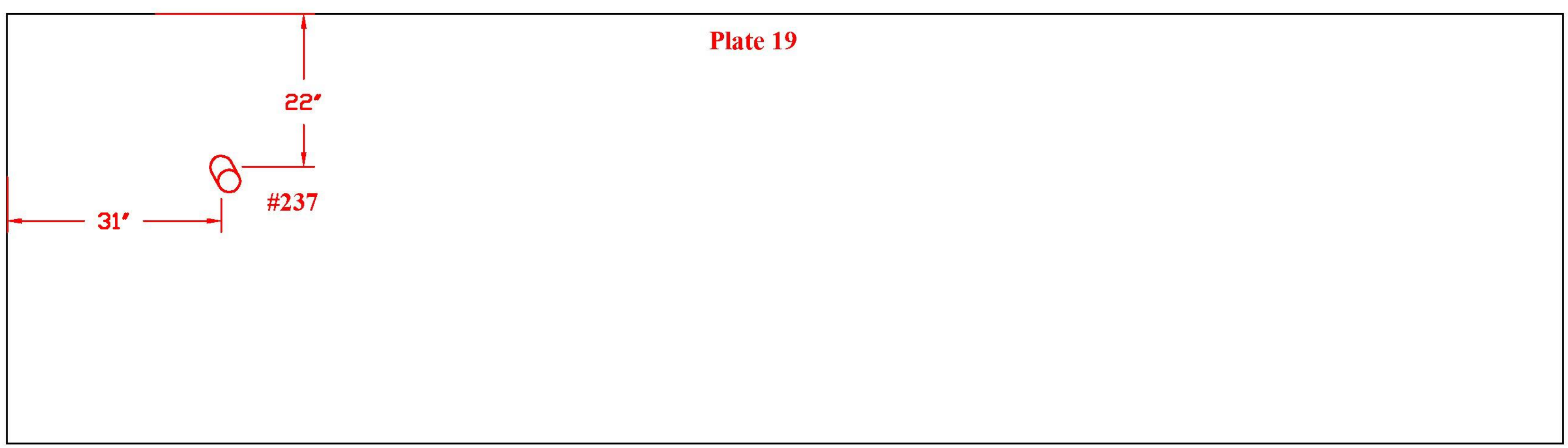


Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 19

Flaw # - Type - Remaining:

#237 - Grout Nozzle - 0.212"R



Drawing is not to scale

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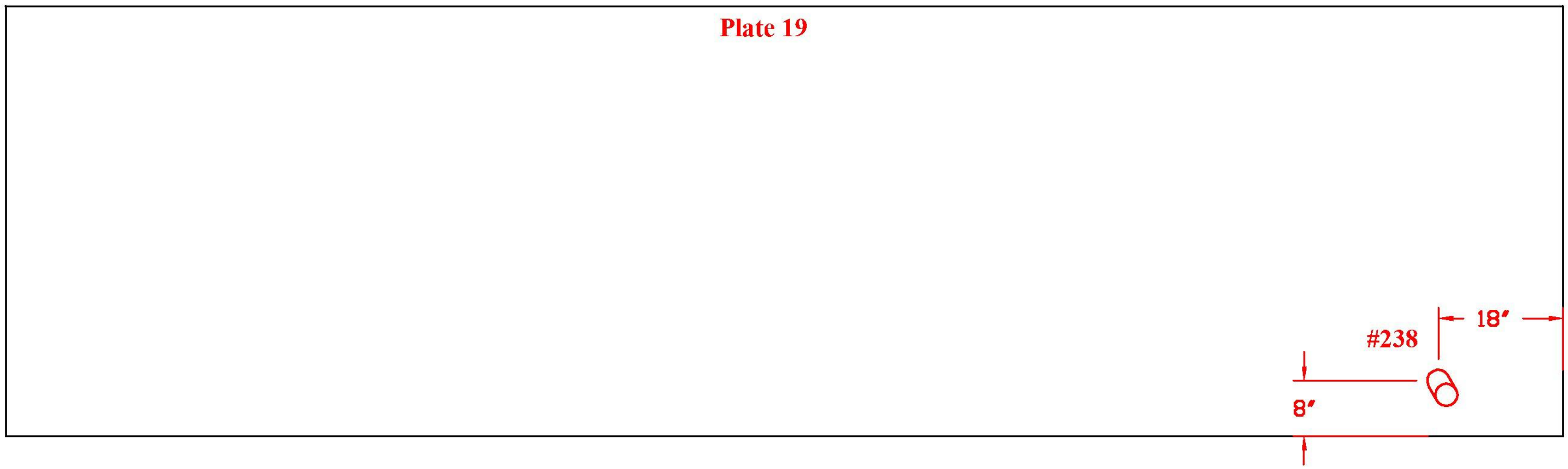
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 1
Plate #: 19

Flaw # - Type - Remaining:

#238 - Grout Nozzle - 0.205"R

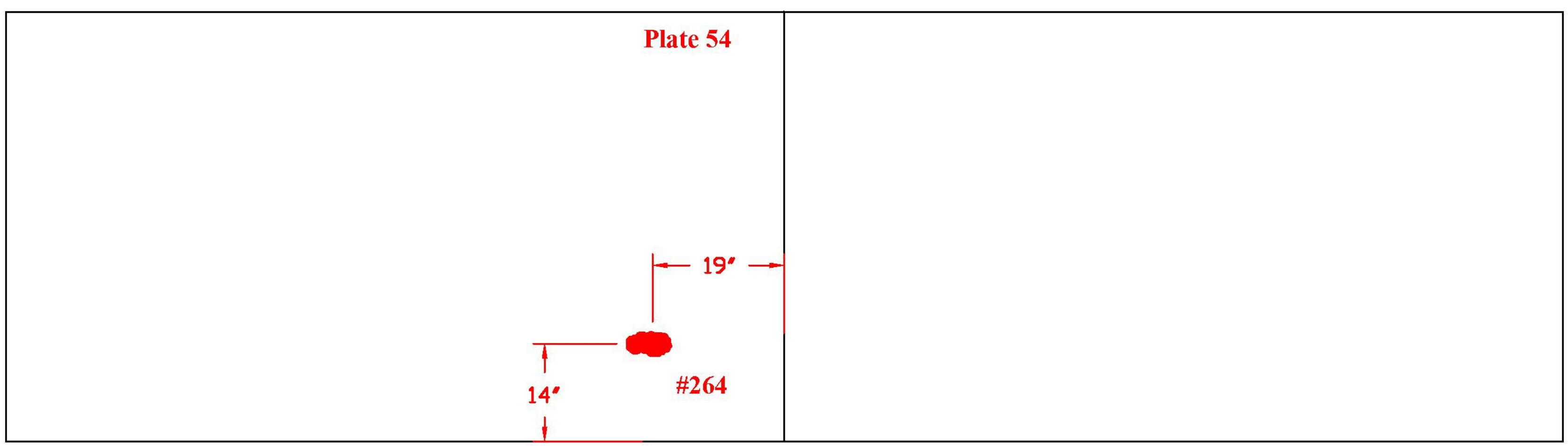


Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 54

Flaw # - Type - Remaining:

#264 - Dent - 0.200" deep



Drawing is not to scale

TANK # 20 - QUADRANT C AND D

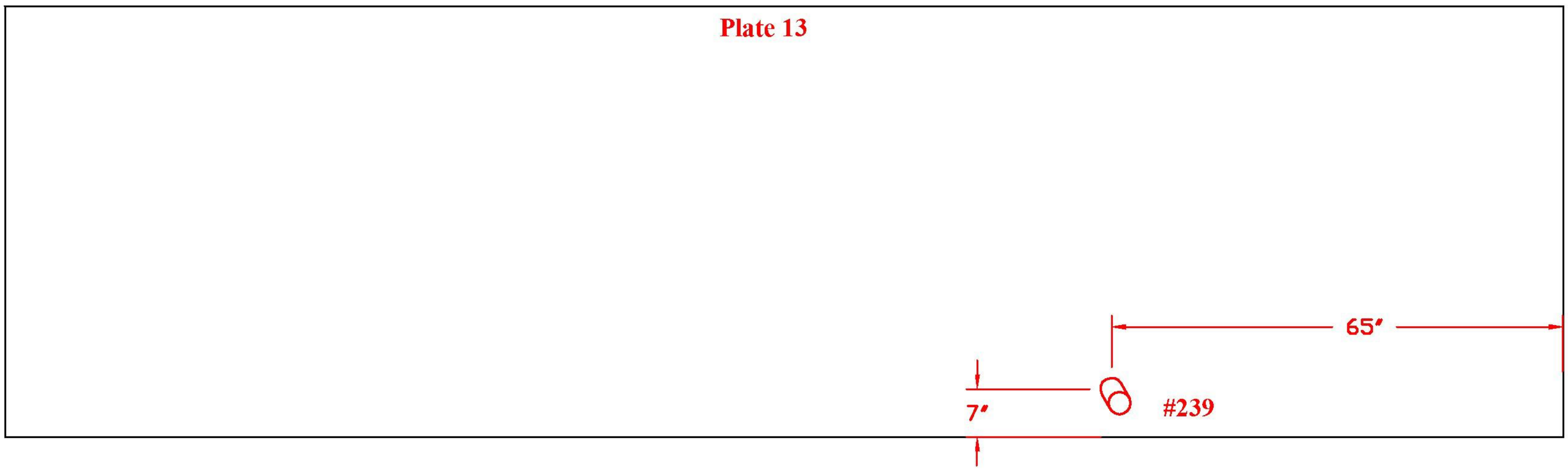
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: C

Course: 1
Plate #: 13

Flaw # - Type - Remaining:

#239- Grout Nozzle - 0.211"R

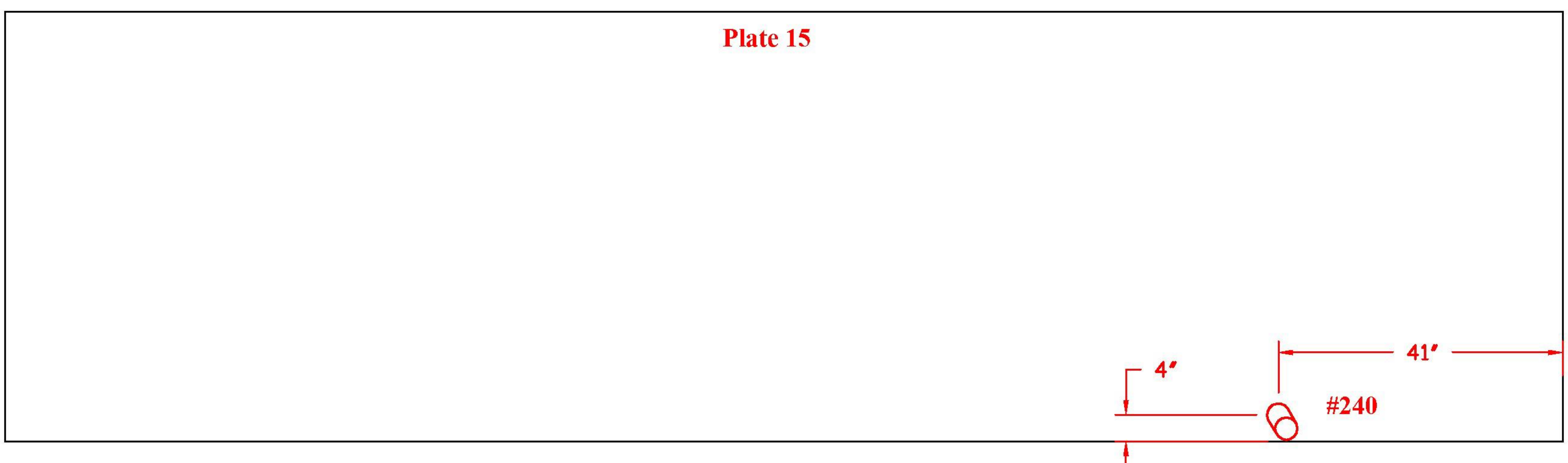


Tank Section: Extension
Quadrant: D

Course: 1
Plate #: 15

Flaw # - Type - Remaining:

#240 - Grout Nozzle - 0.221"R



Drawing is not to scale

TANK # 20 - QUADRANT D

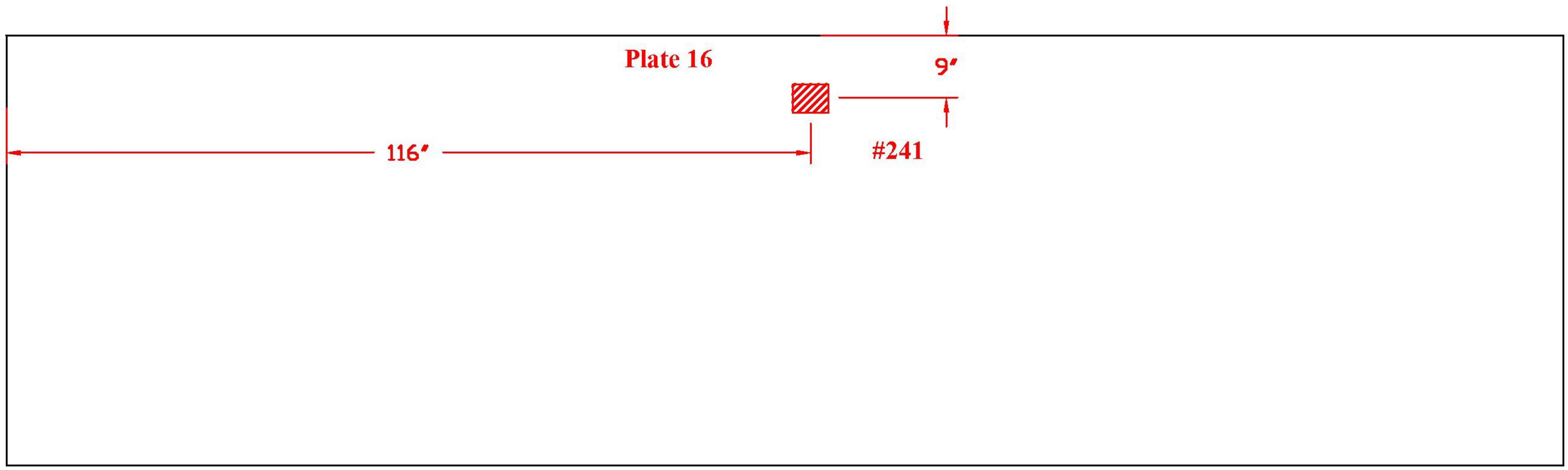
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 4
Plate #: 16

Flaw # - Type - Remaining:

#241- PP - 0.225"R

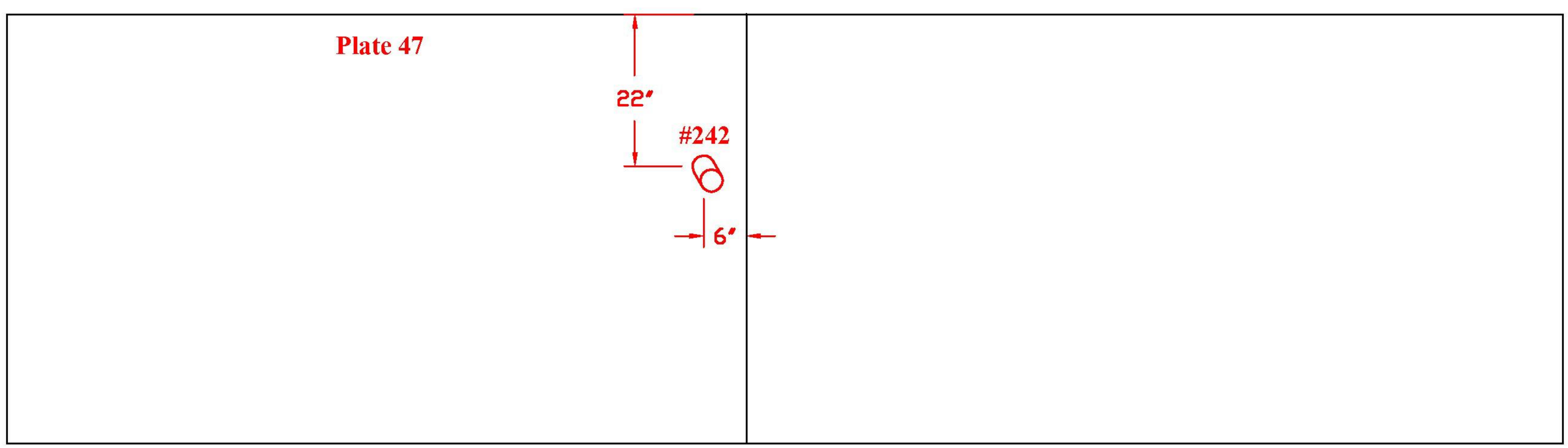


Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 47

Flaw # - Type - Remaining:

#242 - Grout Nozzle - 0.200"R



Drawing is not to scale

TANK # 20 - QUADRANT D

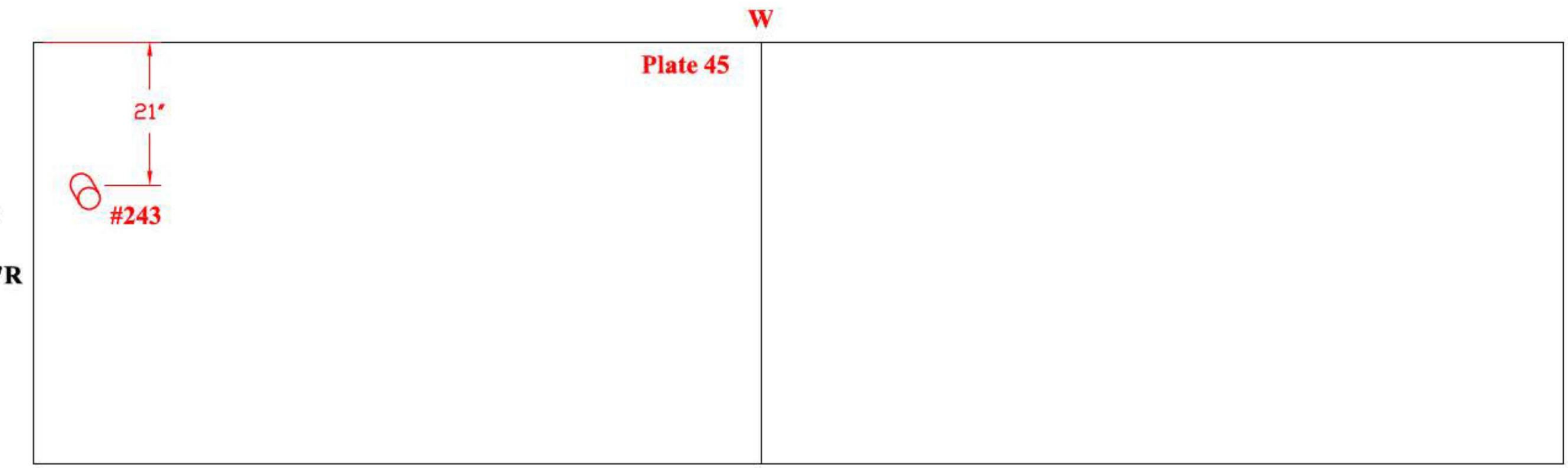
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 45

Flaw # - Type - Remaining:

#243 - Grout Nozzle - 0.211"R



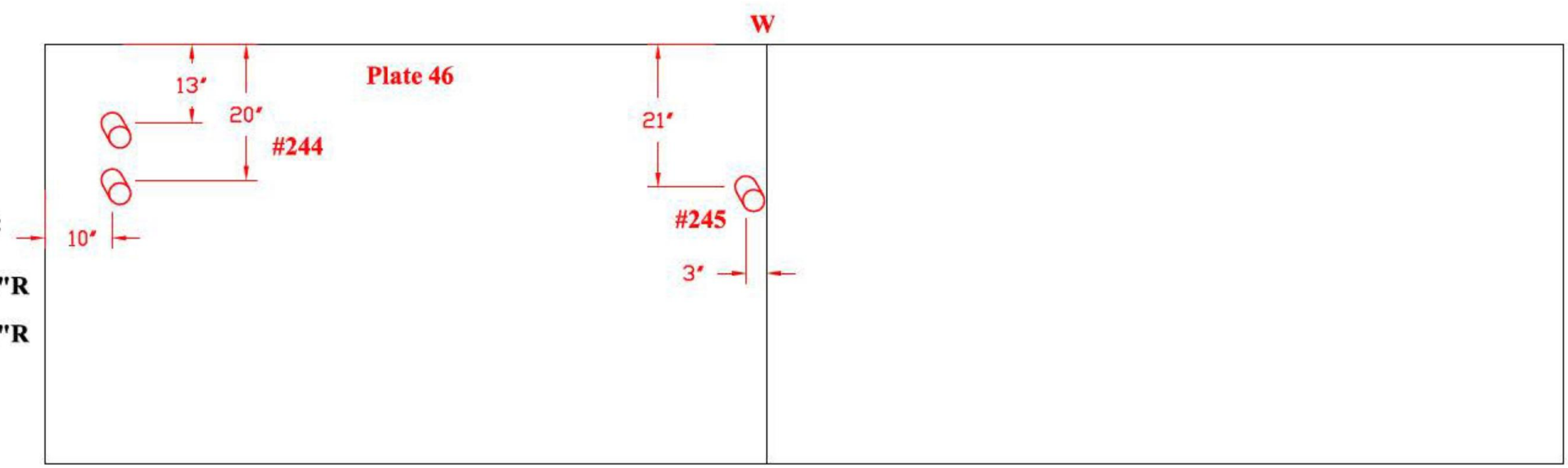
Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 46

Flaw # - Type - Remaining:

#244 - Grout Nozzle - 0.202"R

#245 - Grout Nozzle - 0.211"R



Drawing is not to scale

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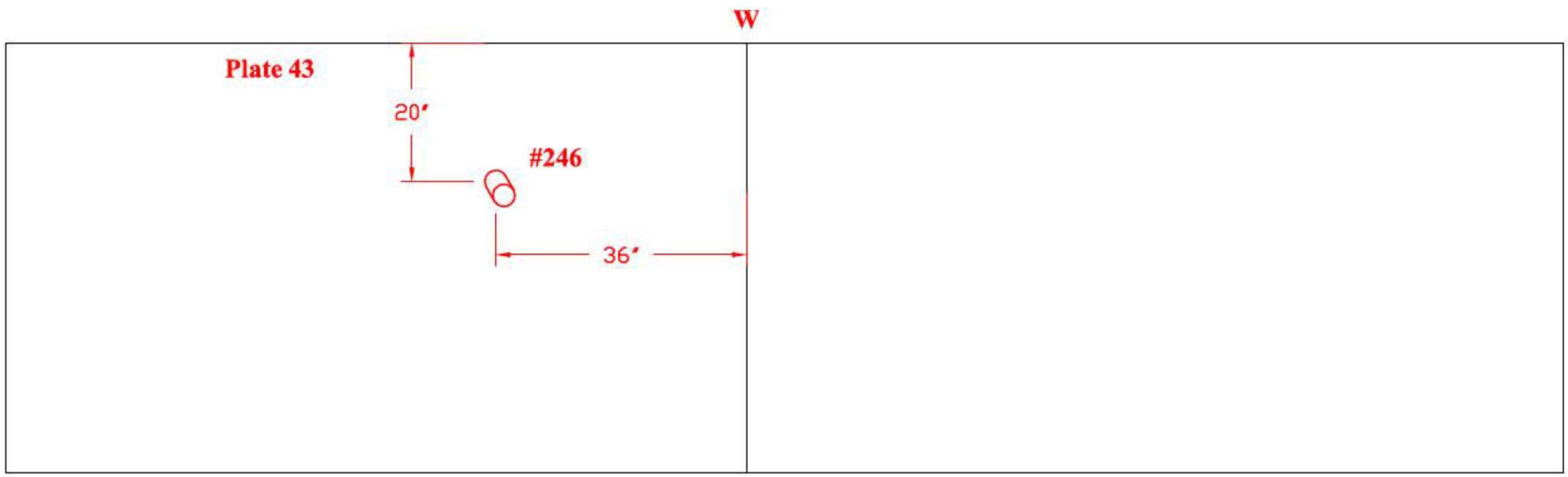
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 43

Flaw # - Type - Remaining:

#246 - Grout Nozzle - 0.197"R



Drawing is not to scale

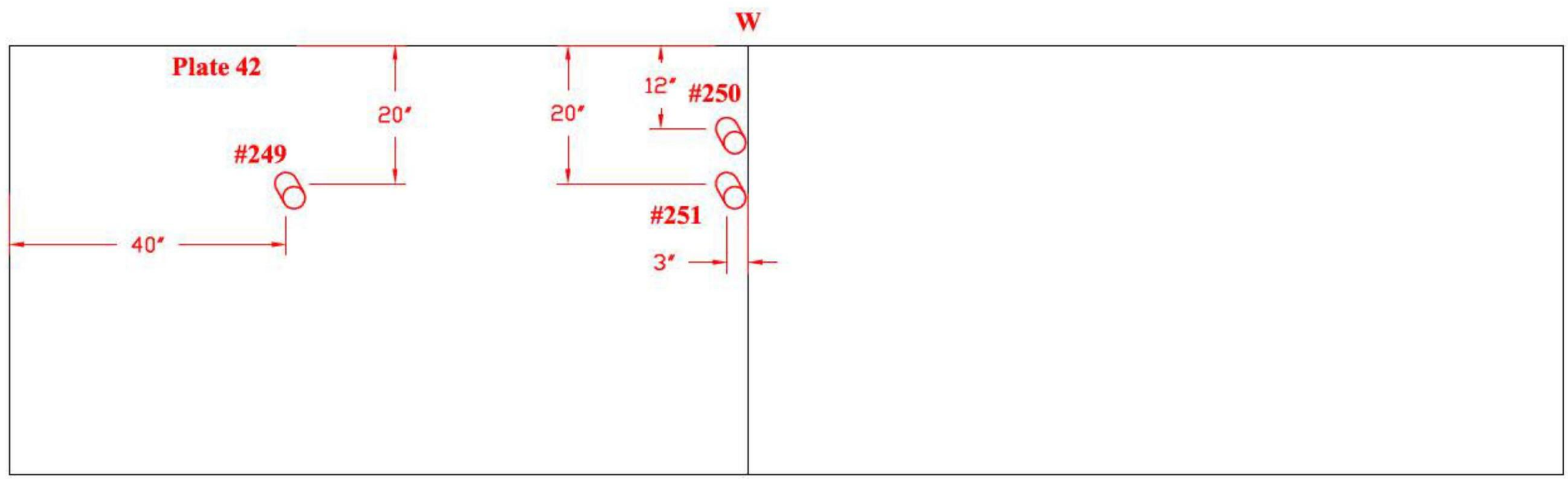
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 42

Flaw # - Type - Remaining:

#249 - Grout Nozzle - 0.212"R
#250 - Grout Nozzle - 0.209"R
#251 - Grout Nozzle - 0.215"R



Drawing is not to scale

TesTex WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 40

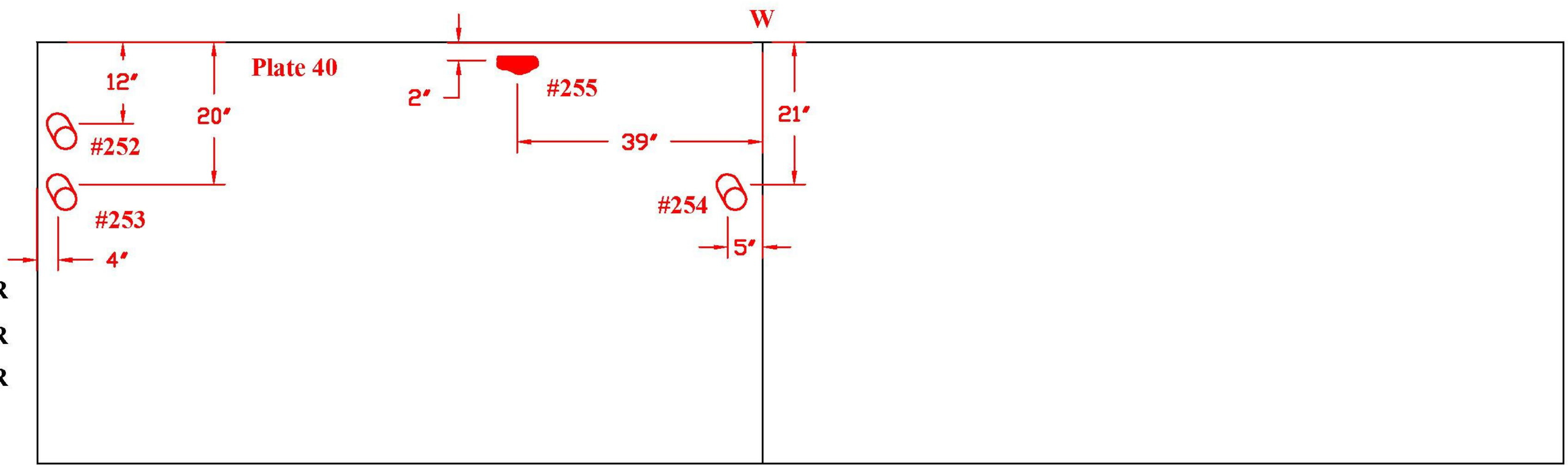
Flaw # - Type - Remaining:

#252 - Grout Nozzle - 0.214"R

#253 - Grout Nozzle - 0.210"R

#254 - Grout Nozzle - 0.203"R

#255 - Dent - 0.200" deep



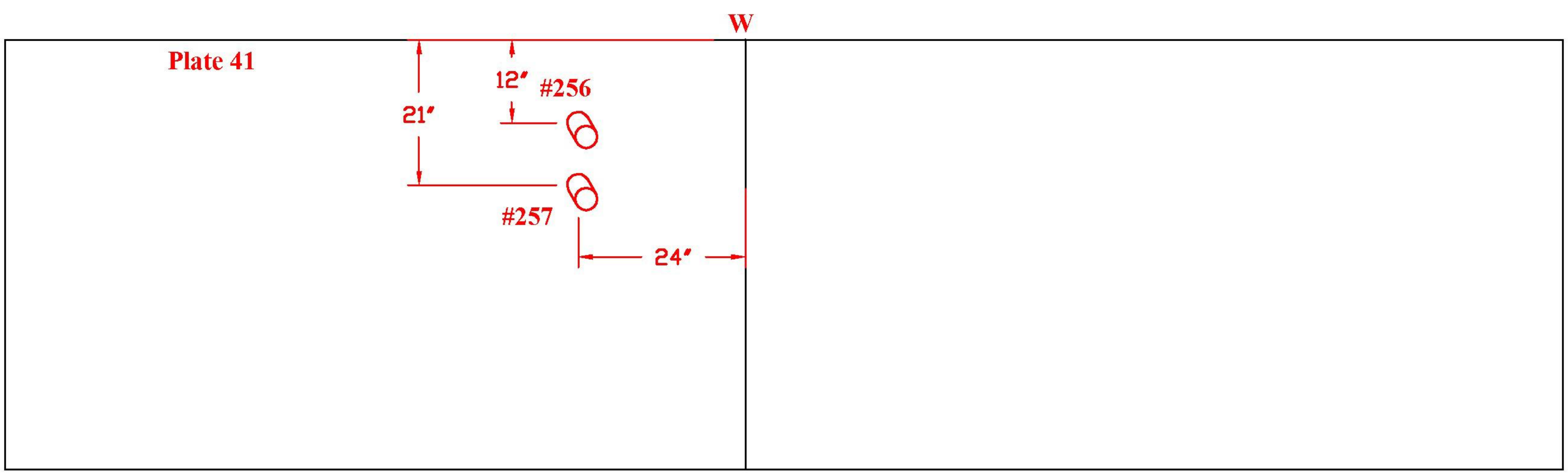
Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 41

Flaw # - Type - Remaining:

#256 - Grout Nozzle - 0.212"R

#257 - Grout Nozzle - 0.214"R



Drawing is not to scale

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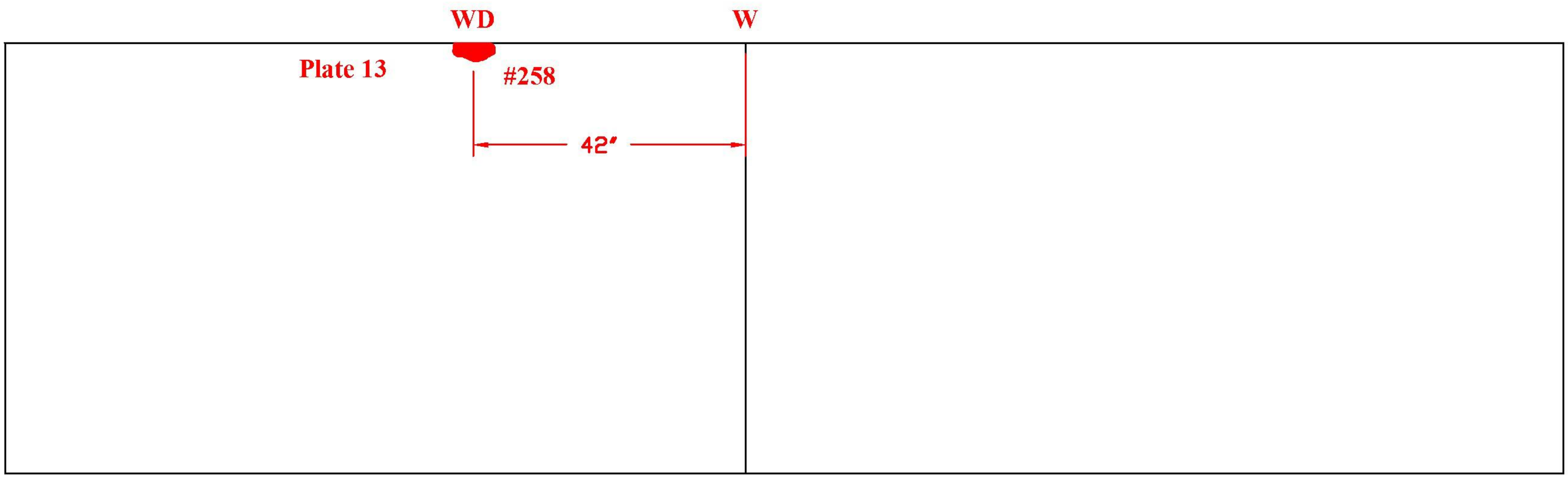
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 4
Plate #: 13

Flaw # - Type - Remaining:

#258 - LOF - 0.147" deep
2" circ.

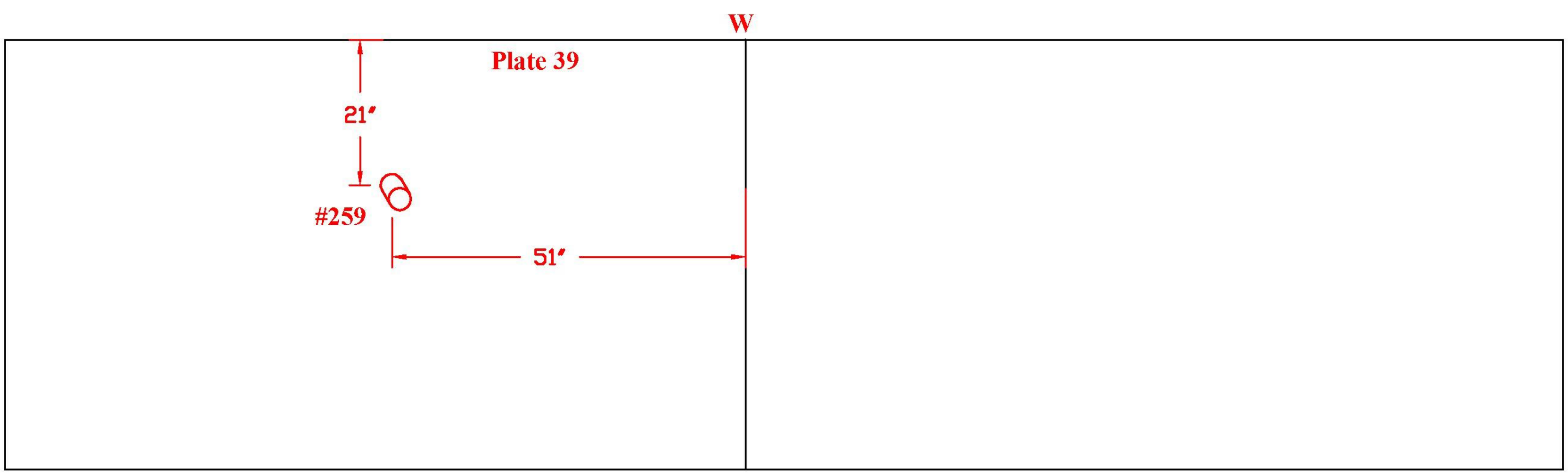


Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 39

Flaw # - Type - Remaining:

#259 - Grout Nozzle - 0.200"R



Drawing is not to scale

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TANK # 20 - QUADRANT D

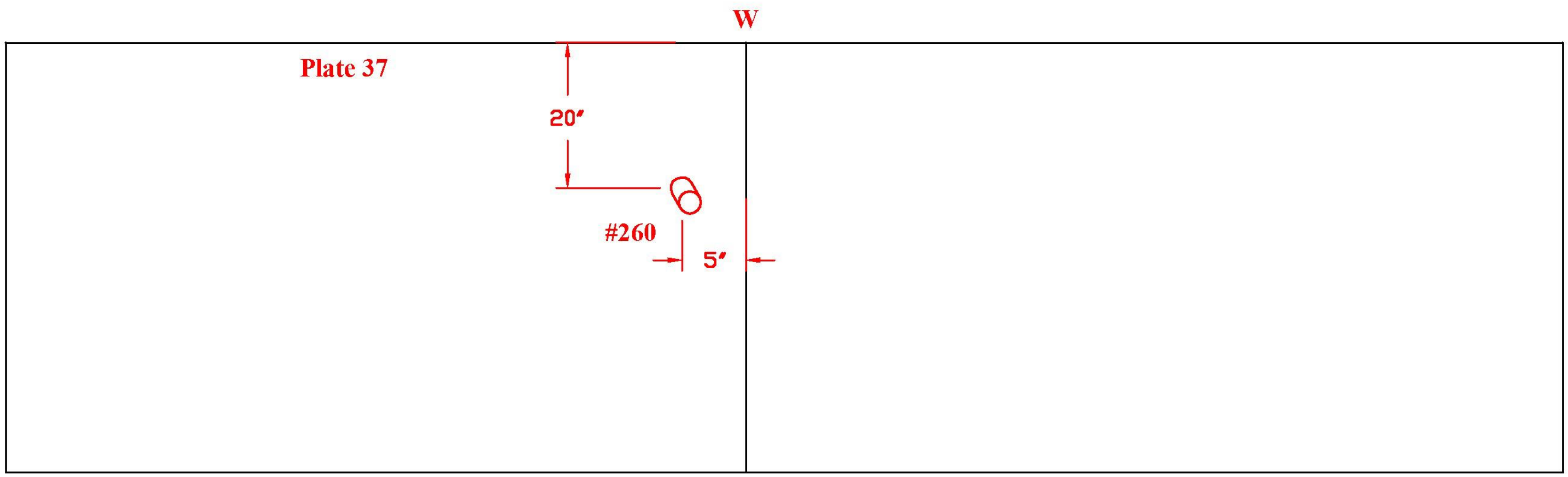
**Nominal Plate Thickness: 0.250"*

Tank Section: Extension
Quadrant: D

Course: 2
Plate #: 37

Flaw # - Type - Remaining:

#260 - Grout Nozzle - 0.203"R



Tank Section: Extension
Quadrant: D

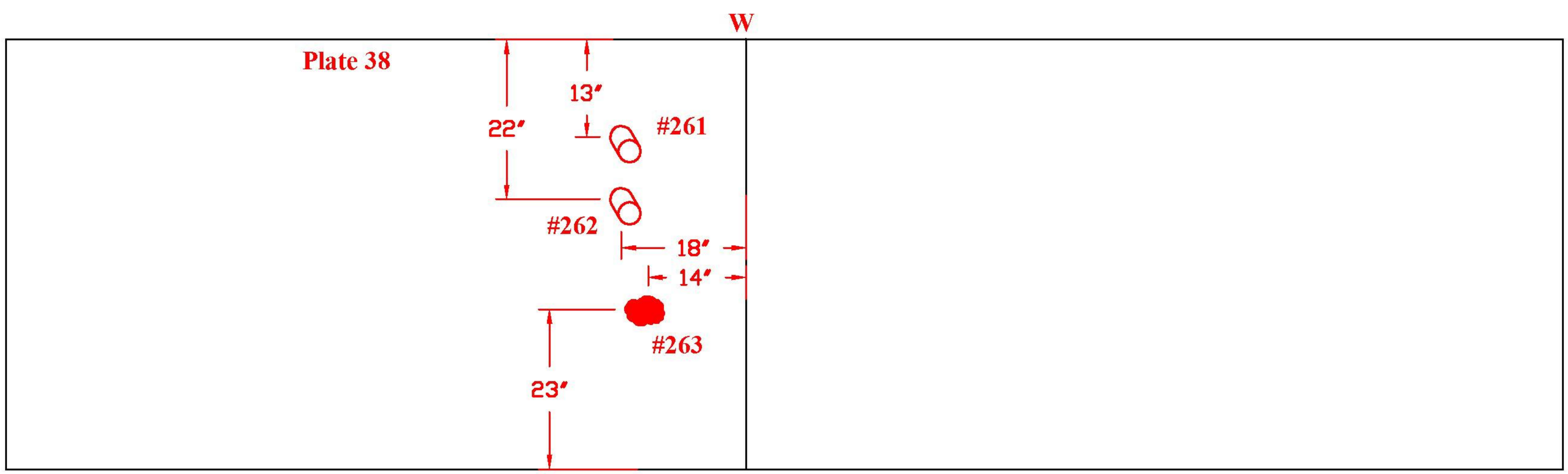
Course: 2
Plate #: 38

Flaw # - Type - Remaining:

#261 - Grout Nozzle - 0.209"R

#262 - Grout Nozzle - 0.205"R

#263 - Dent - 0.200" deep



Drawing is not to scale

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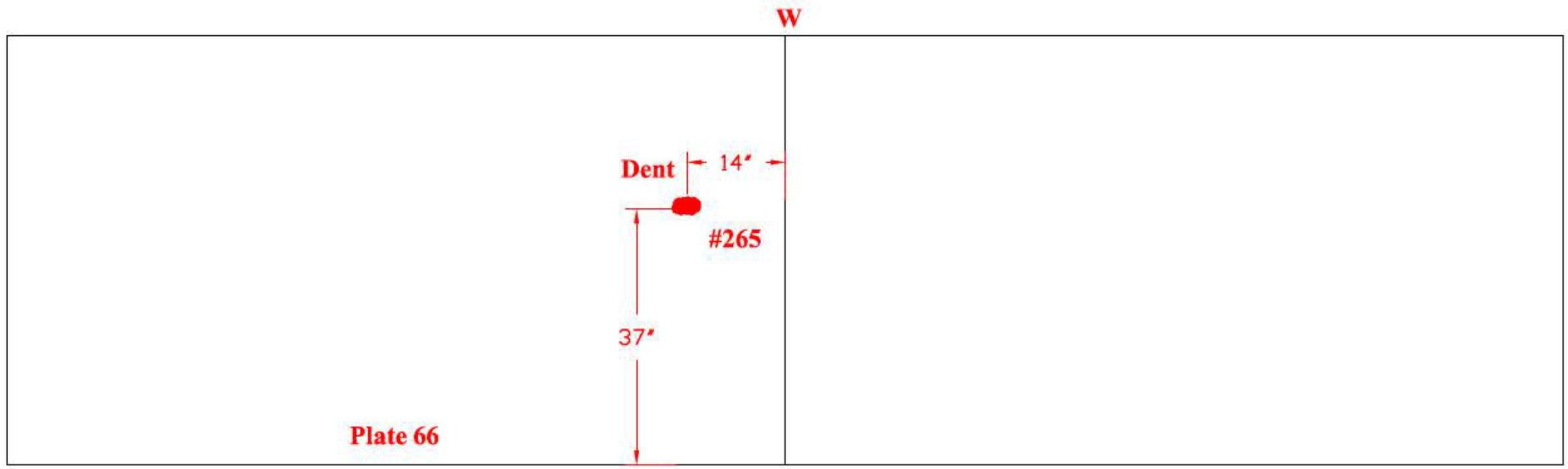
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Date Inspected/Confirmed: 10/08/2008

Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 66
Flaw # - Type - Remaining:

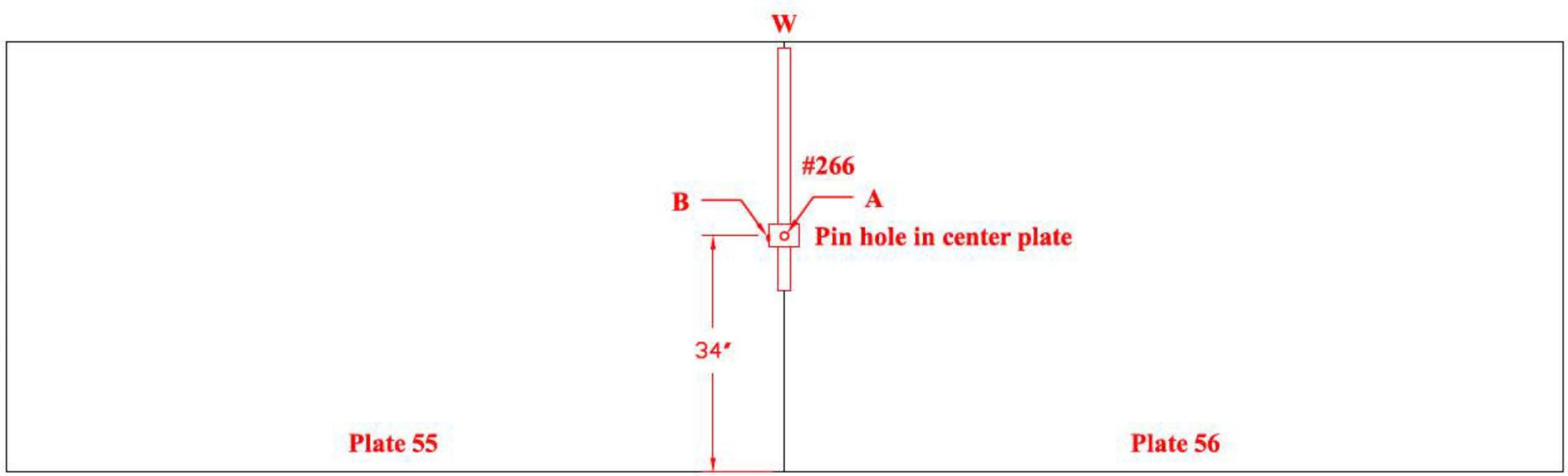
#265 - Dent - 0.200"deep



Tank Section:Upper Dome
Quadrant: D

Course: A
Plate #: 55/56
Flaw # - Type - Remaining:

#266: A) BS-TW-LOF-0.092"D
1 "dia
B) BS-TW-LOF-0.092"D
1 "dia



Drawing is not to scale

TANK # 20 - QUADRANT B

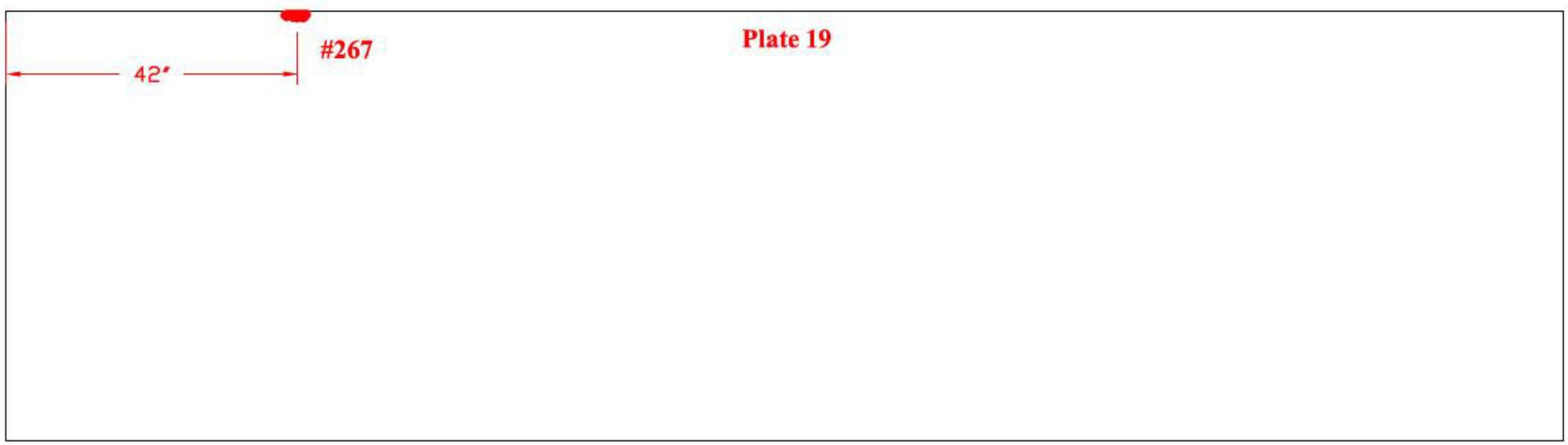
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 19

Flaw # - Type - Remaining:

#267 - WP - 0.156" deep

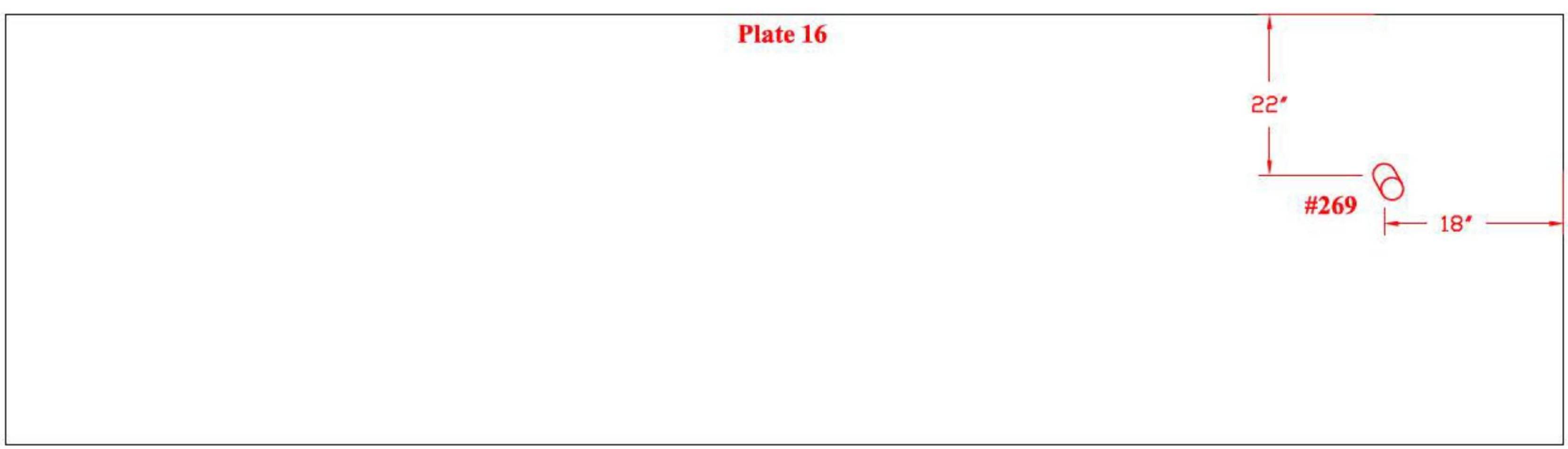


Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 16

Flaw # - Type - Remaining:

#269 - Grout Nozzle - 0.212"R



Drawing is not to scale

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TANK # 20 - QUADRANT B

**Nominal Plate Thickness: 0.250"*

Tank Section: Extension
Quadrant: B

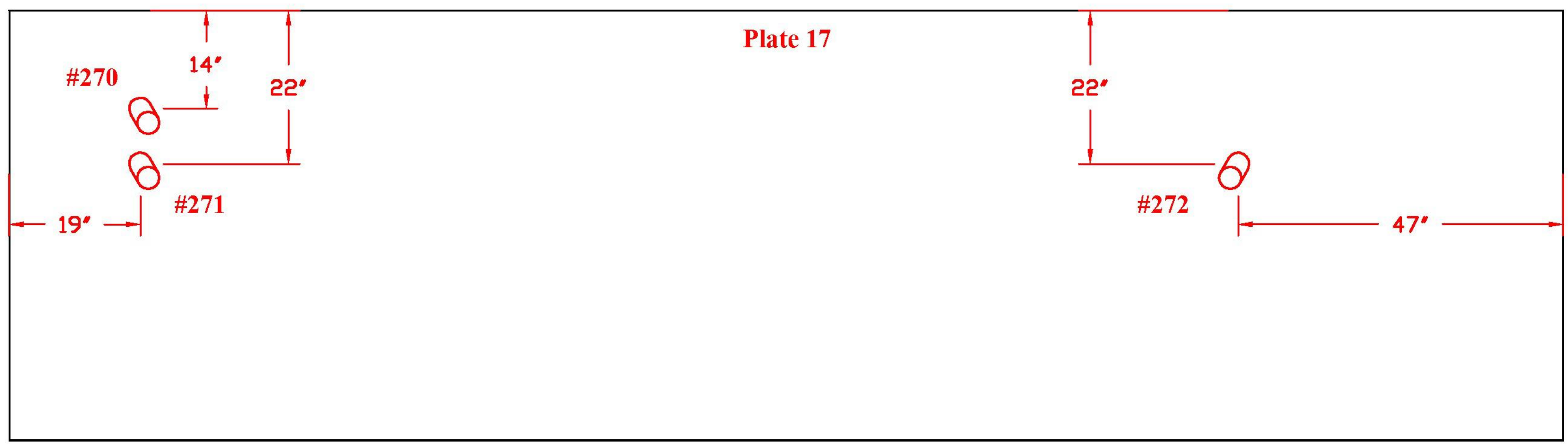
Course: 2
Plate #: 17

Flaw # - Type - Remaining:

#270 - Grout Nozzle - 0.217"R

#271 - Grout Nozzle - 0.215"R

#272 - Grout Nozzle - 0.196"R



Tank Section: Extension
Quadrant: B

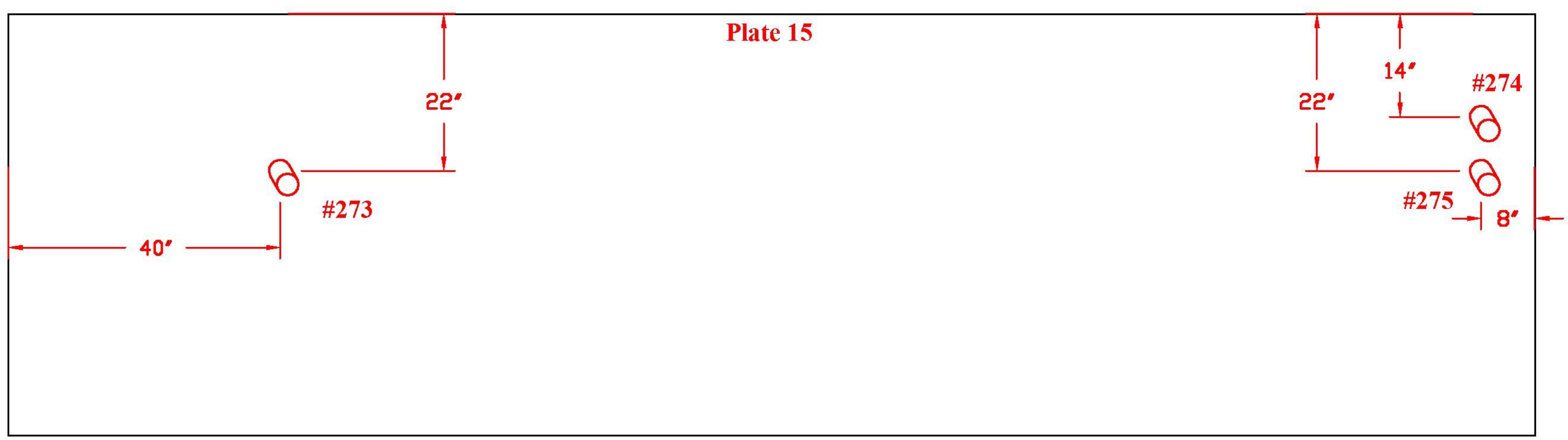
Course: 2
Plate #: 15

Flaw # - Type - Remaining:

#273 - Grout Nozzle - 0.217"R

#274 - Grout Nozzle - 0.210"R

#275 - Grout Nozzle - 0.219"R



Drawing is not to scale

TesTex
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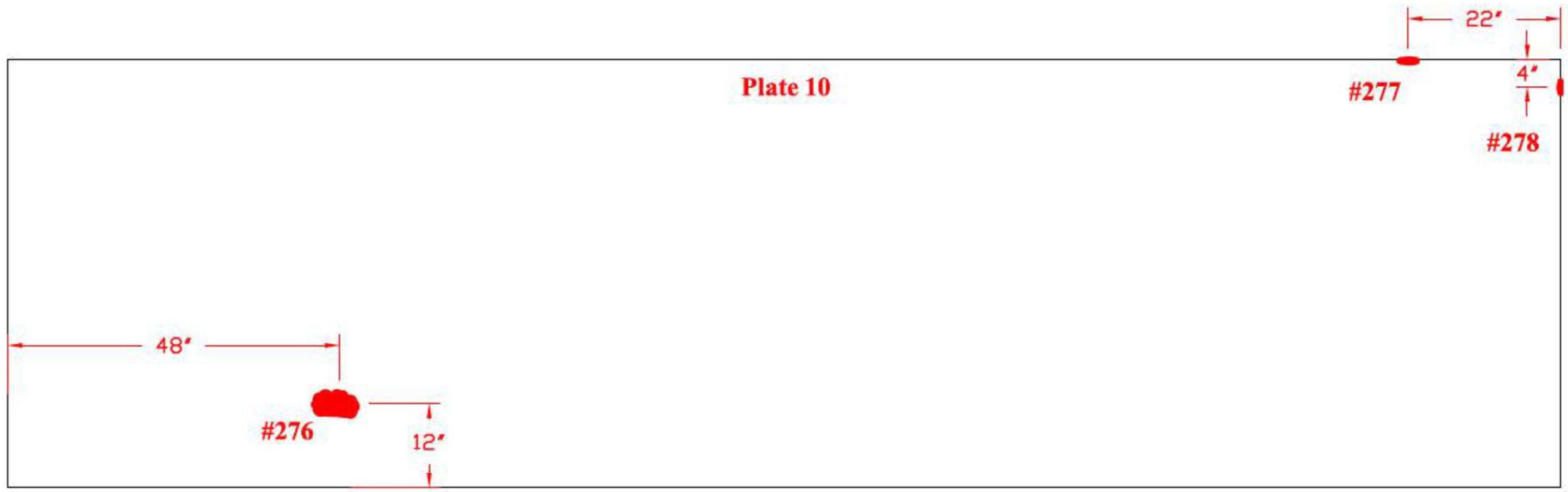
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: B

Course: 3
Plate #: 10

Flaw # - Type - Remaining:

#276 - Gouge - 0.210" deep
#277 - LOF - 0.152" D 2.5"L
LOF - 0.094" D 2.5"L
#278 - LOF - 0.206" D 4"L
LOF - 0.230" D 4"L



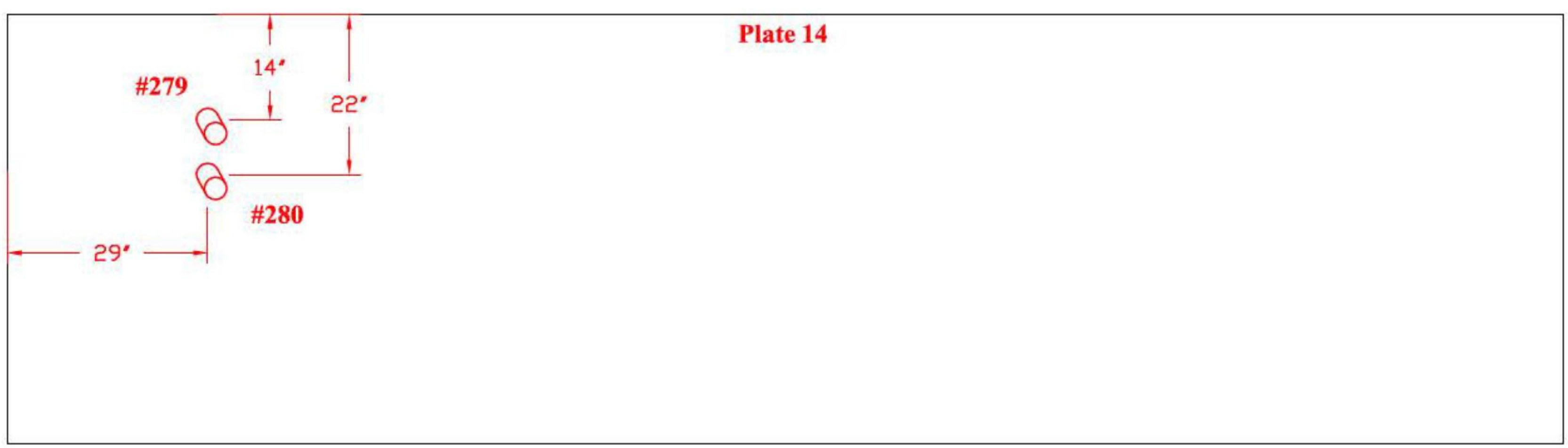
Tank Section: Extension
Quadrant: B

Course: 2
Plate #: 14

Flaw # - Type - Remaining:

#279 - Grout Nozzle - 0.237"R

#280 - Grout Nozzle - 0.235"R



Drawing is not to scale

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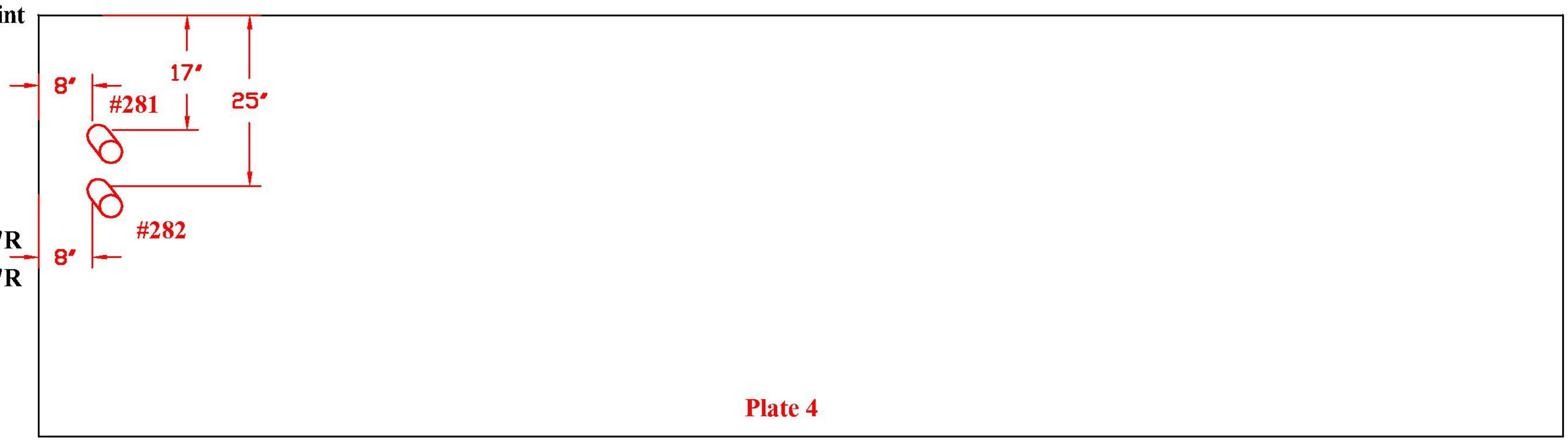
TANK # 20 - QUADRANT A

Nominal Plate Thickness: 0.250"

Tank Section: Expansion Joint
Quadrant: A

Course: 2
Plate #: 4
Flaw # - Type - Remaining:

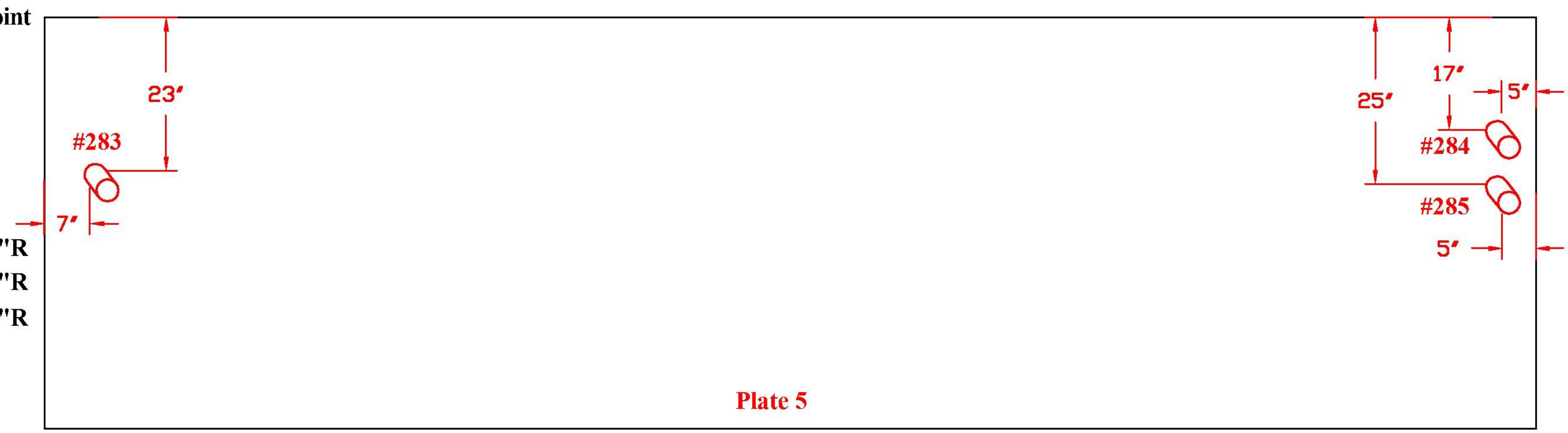
#281 - Grout Nozzle - 0.208"R
#282 - Grout Nozzle - 0.206"R



Tank Section: Expansion Joint
Quadrant: A

Course: 2
Plate #: 5
Flaw # - Type - Remaining:

#283 - Grout Nozzle - 0.195"R
#284 - Grout Nozzle - 0.194"R
#285 - Grout Nozzle - 0.208"R



Drawing is not to scale

TesTex
WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT A

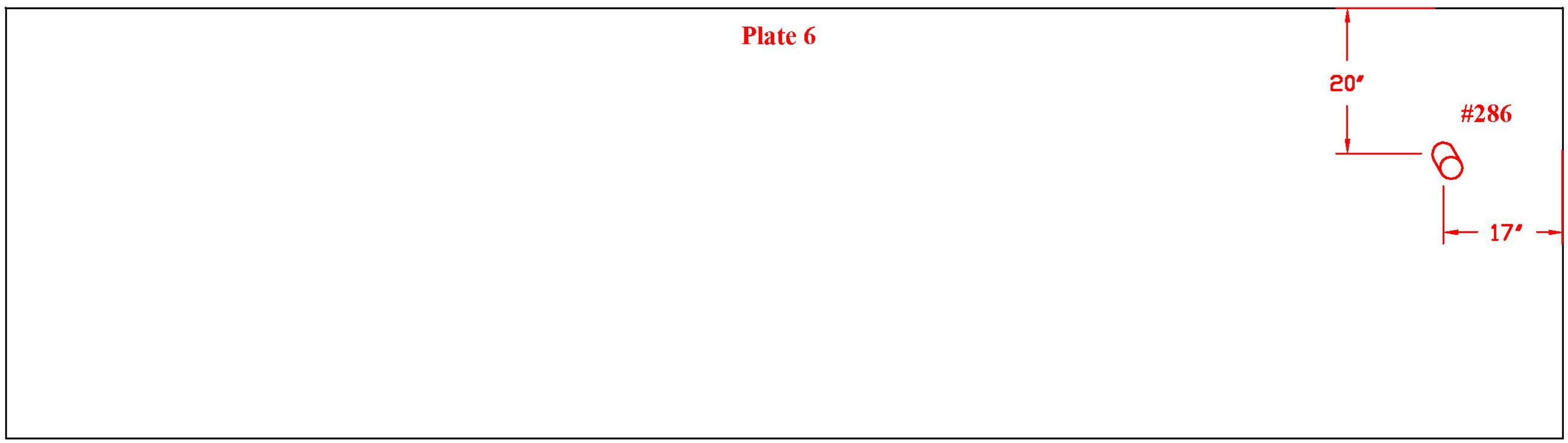
**Nominal Plate Thickness: 0.250"*

Tank Section: Extension
Quadrant: A

Course: 2
Plate #: 6

Flaw # - Type - Remaining:

#286 - Grout Nozzle - 0.198"R



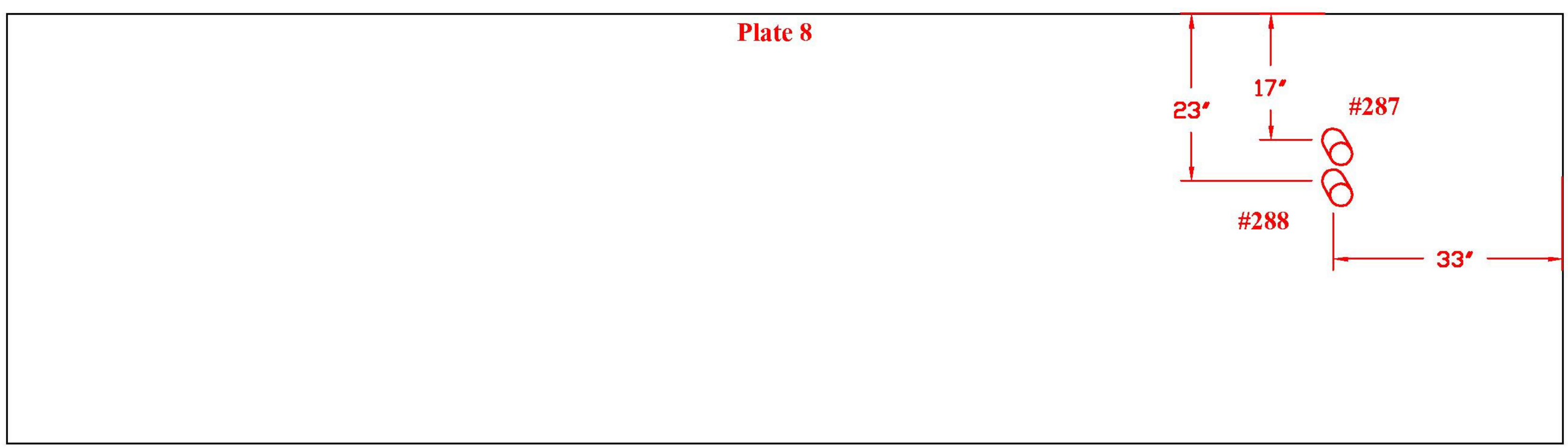
Tank Section: Extension
Quadrant: A

Course: 2
Plate #: 8

Flaw # - Type - Remaining:

#287 - Grout Nozzle - 0.216"R

#288- Grout Nozzle - 0.215"R



Drawing is not to scale

TANK # 20 - QUADRANT A

Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: A

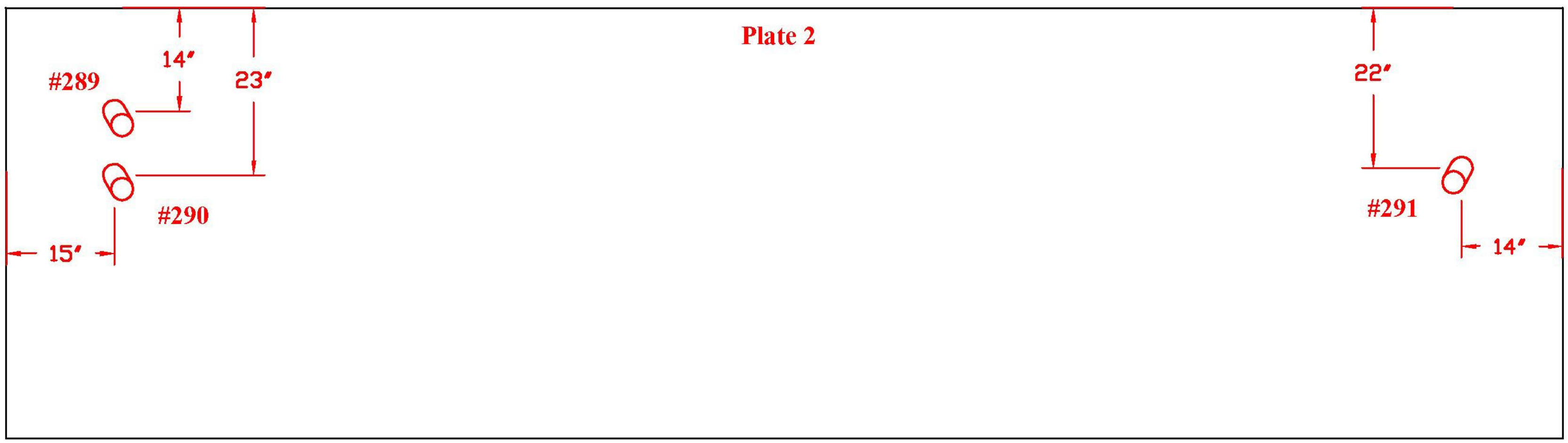
Course: 2
Plate #: 10

Flaw # - Type - Remaining:

#289 - Grout Nozzle - 0.224"R

#290 - Grout Nozzle - 0.228"R

#291 - Grout Nozzle - 0.208"R

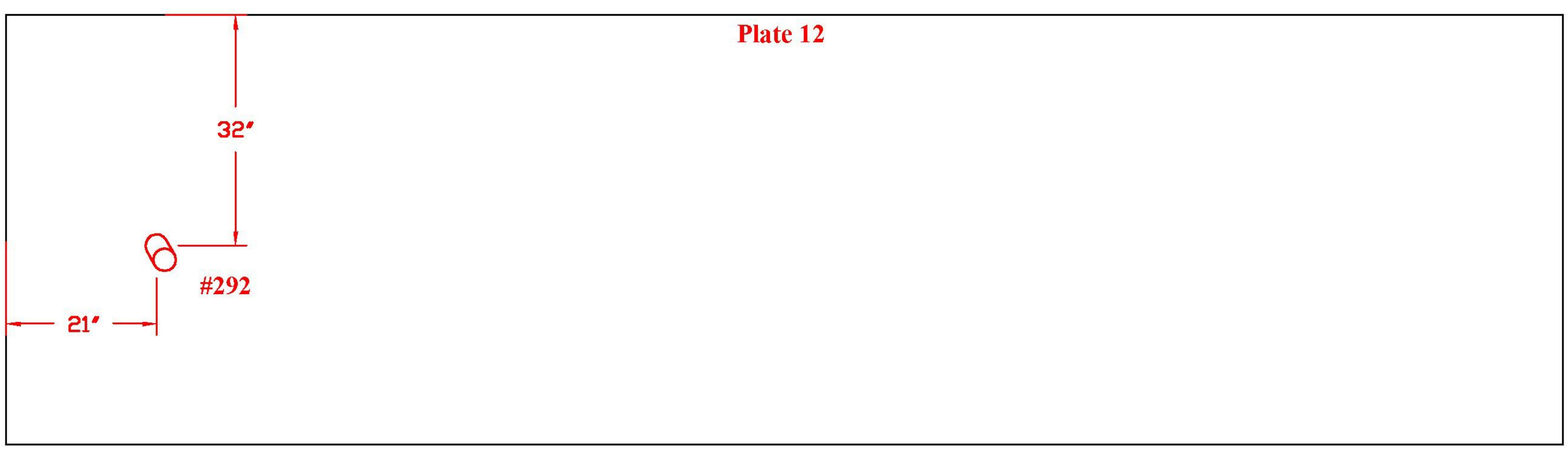


Tank Section: Extension
Quadrant: A

Course: 2
Plate #: 12

Flaw # - Type - Remaining:

#292 - Grout Nozzle - 0.210"R



Drawing is not to scale

TANK # 20 - QUADRANT A

Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: A

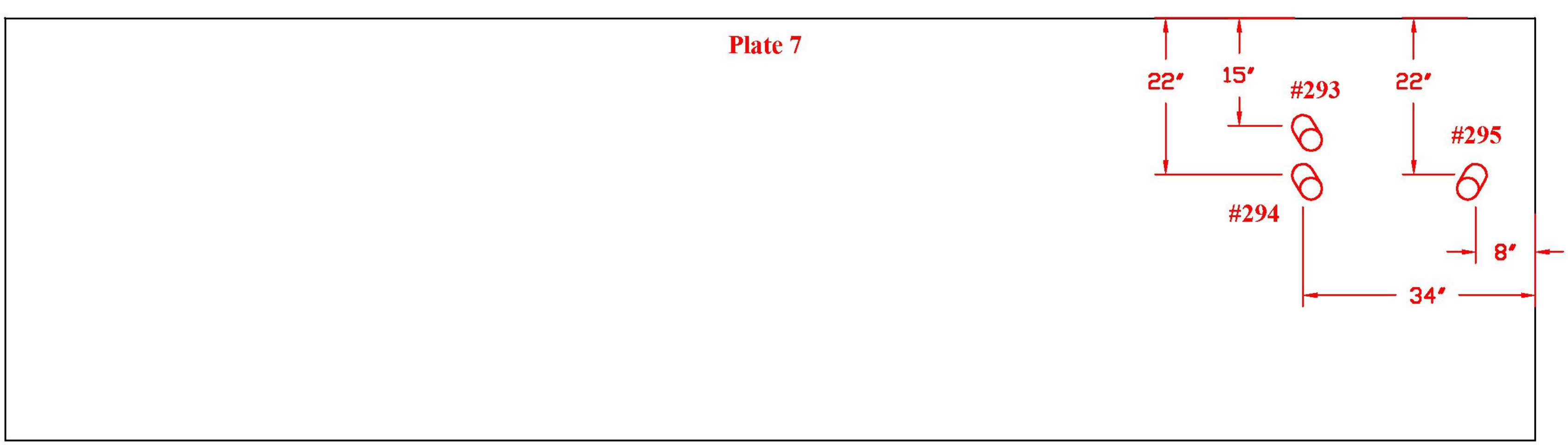
Course: 2
Plate #: 7

Flaw # - Type - Remaining:

#293 - Grout Nozzle - 0.202"R

#294 - Grout Nozzle - 0.219"R

#295 - Grout Nozzle - 0.194"R

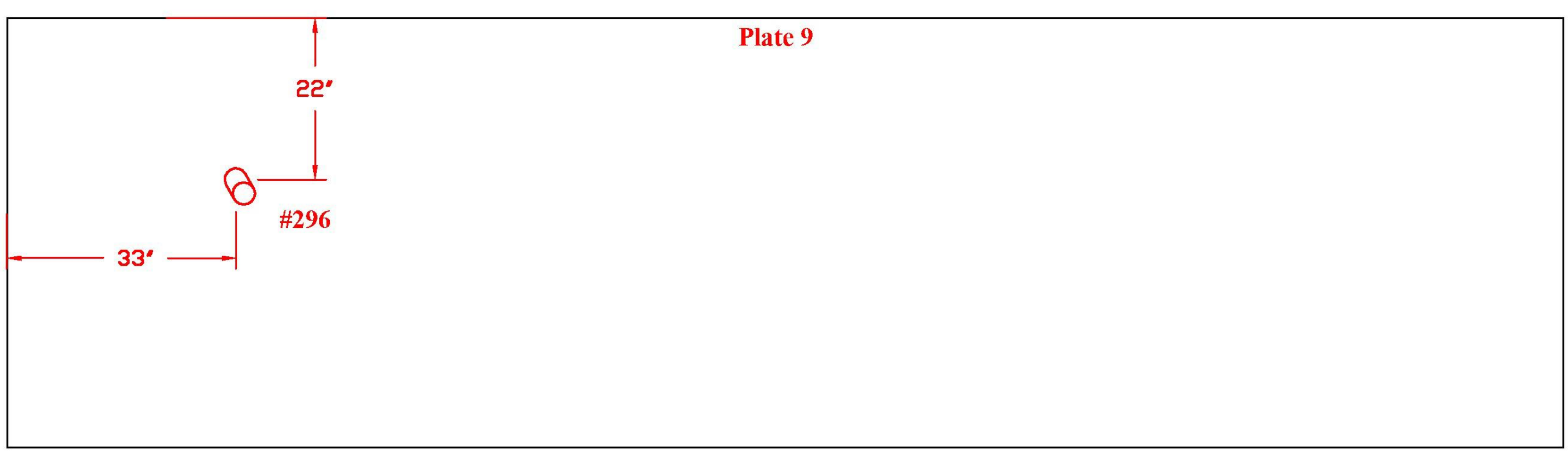


Tank Section: Extension
Quadrant: A

Course: 2
Plate #: 9

Flaw # - Type - Remaining:

#296 - Grout Nozzle - 0.218"R



Drawing is not to scale

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TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

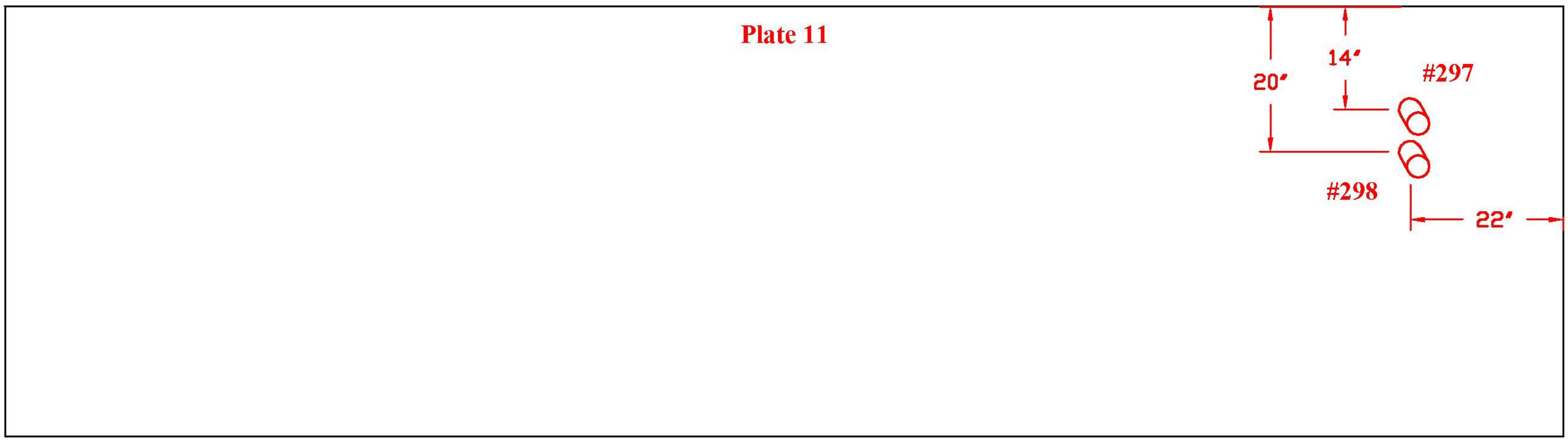
Tank Section: Extension
Quadrant: A

Course: 2
Plate #: 11

Flaw # - Type - Remaining:

#297 - Grout Nozzle - 0.197"R

#298 - Grout Nozzle - 0.208"R



Tank Section: Extension
Quadrant: B

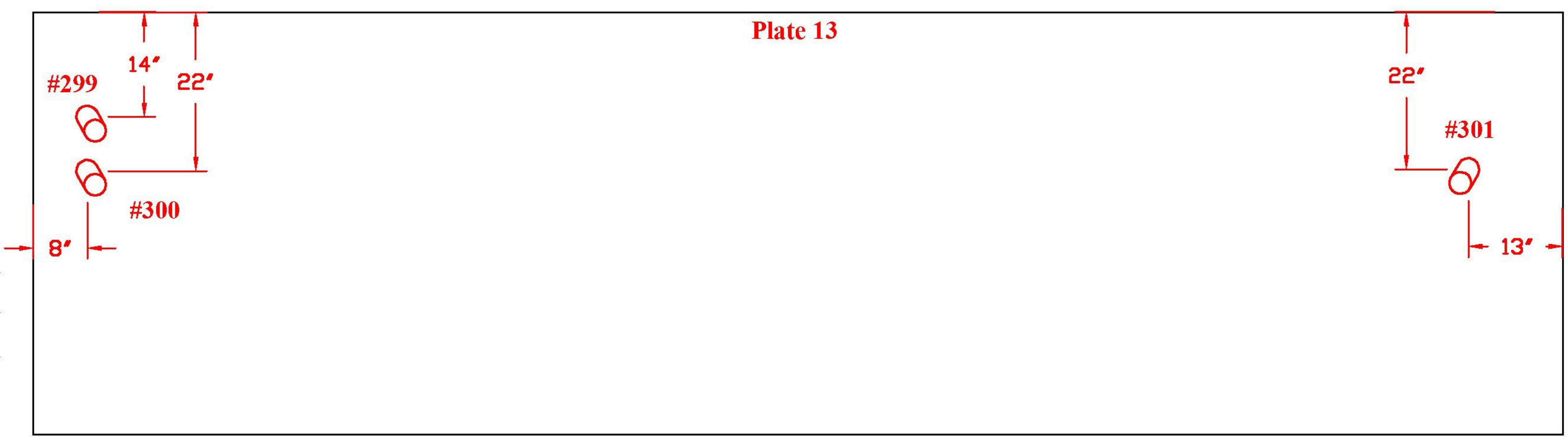
Course: 2
Plate #: 13

Flaw # - Type - Remaining:

#299 - Grout Nozzle - 0.222"R

#300 - Grout Nozzle - 0.219"R

#301 - Grout Nozzle - 0.215"R



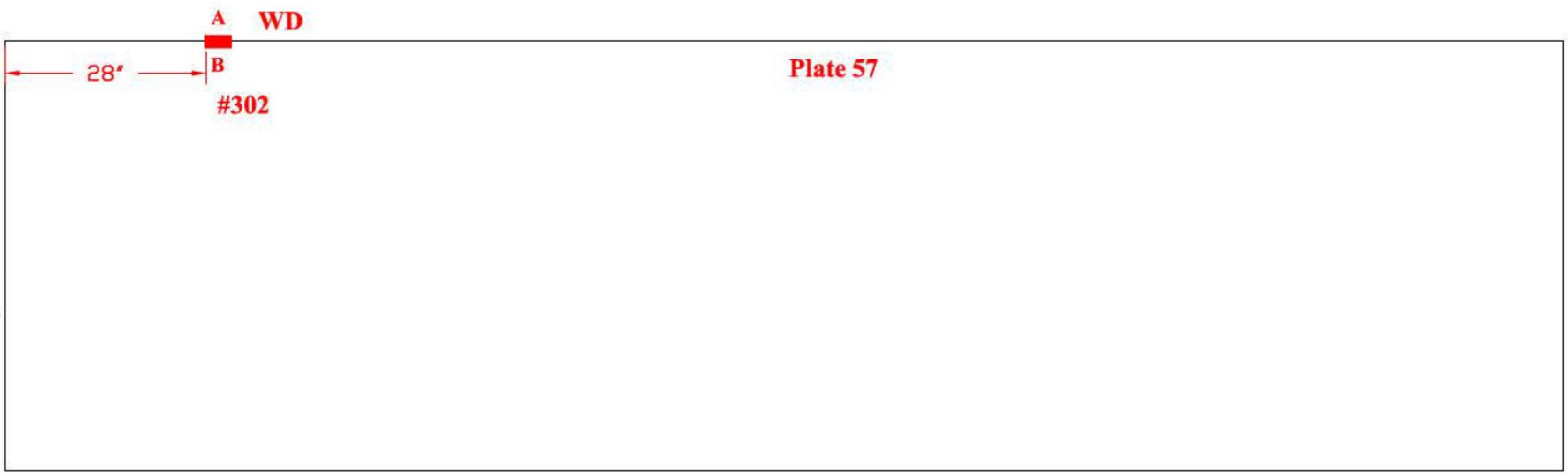
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 57
Flaw # - Type - Remaining:

#302: A) LOF - 0.234"D 1.5"L
B) LOF - 0.144"D 1.5"L



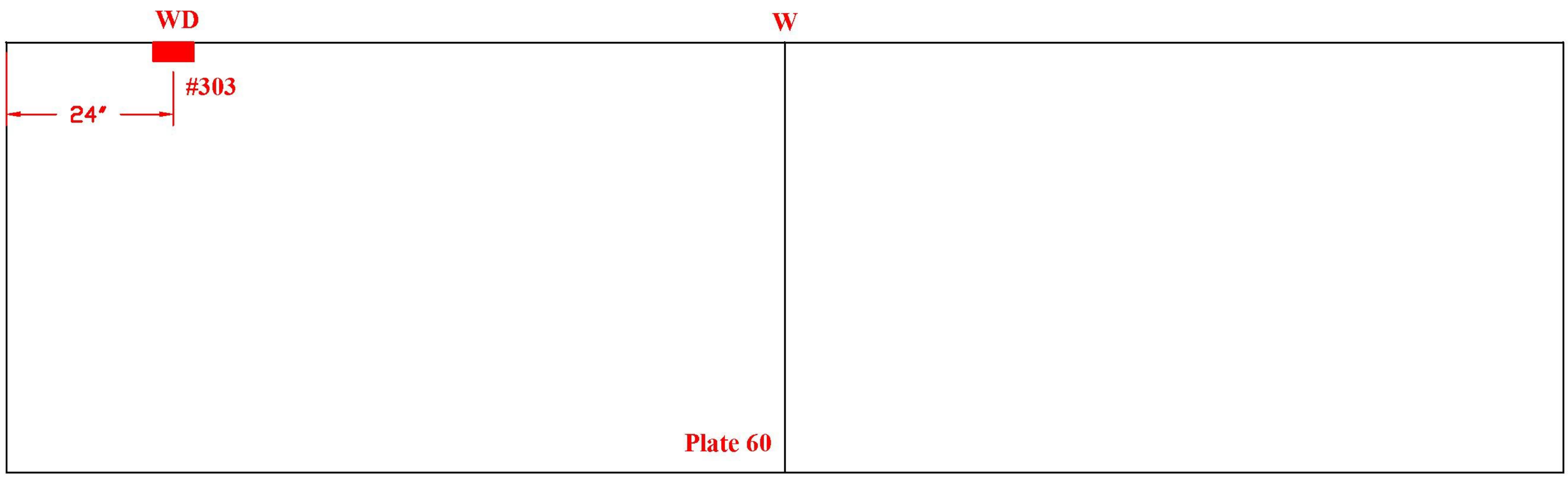
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 60
Flaw # - Type - Remaining:

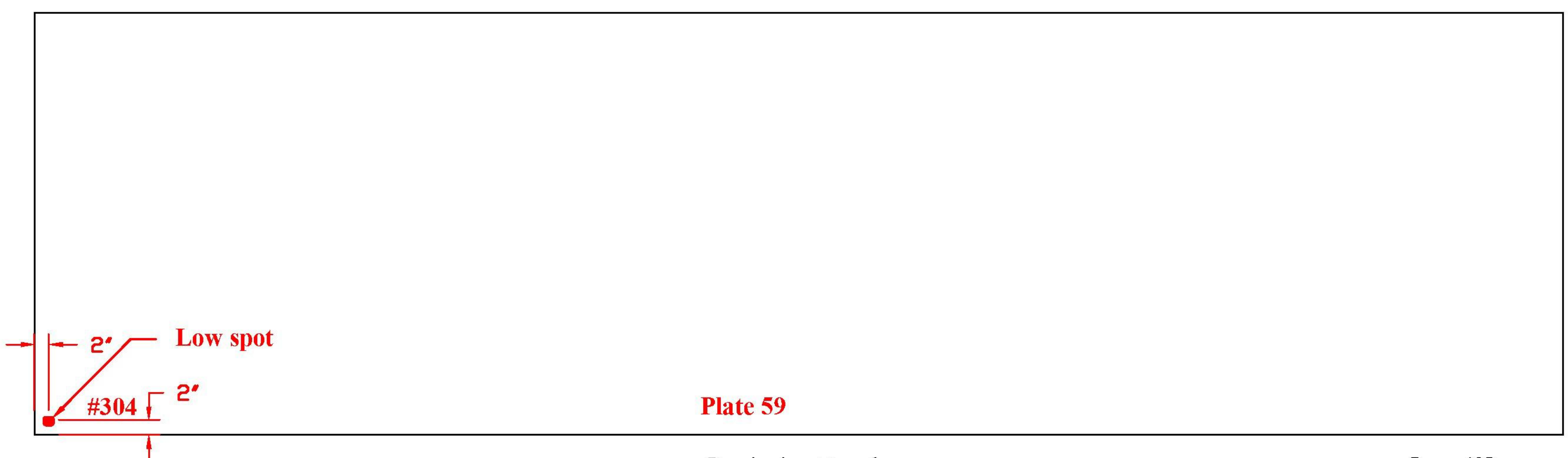
#303 - LOF - 0.081"D 2.5"L



Tank Section:Upper Dome
Quadrant: D

Course: A
Plate #: 59
Flaw # - Type - Remaining:

#304 - WL - 0.165"R



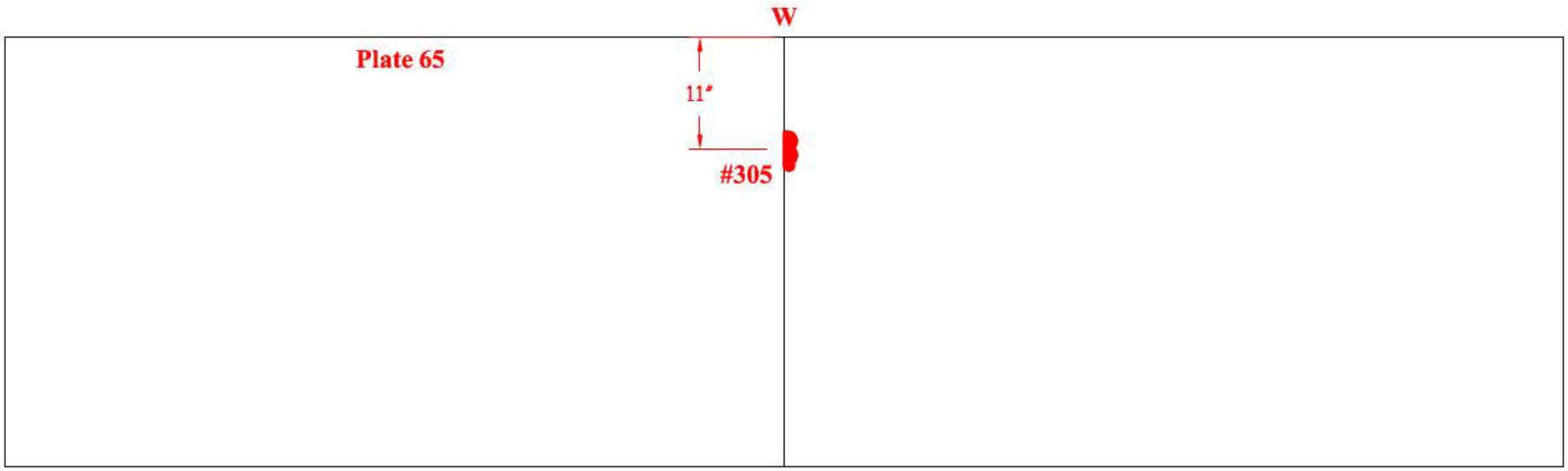
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 65
Flaw # - Type - Remaining:

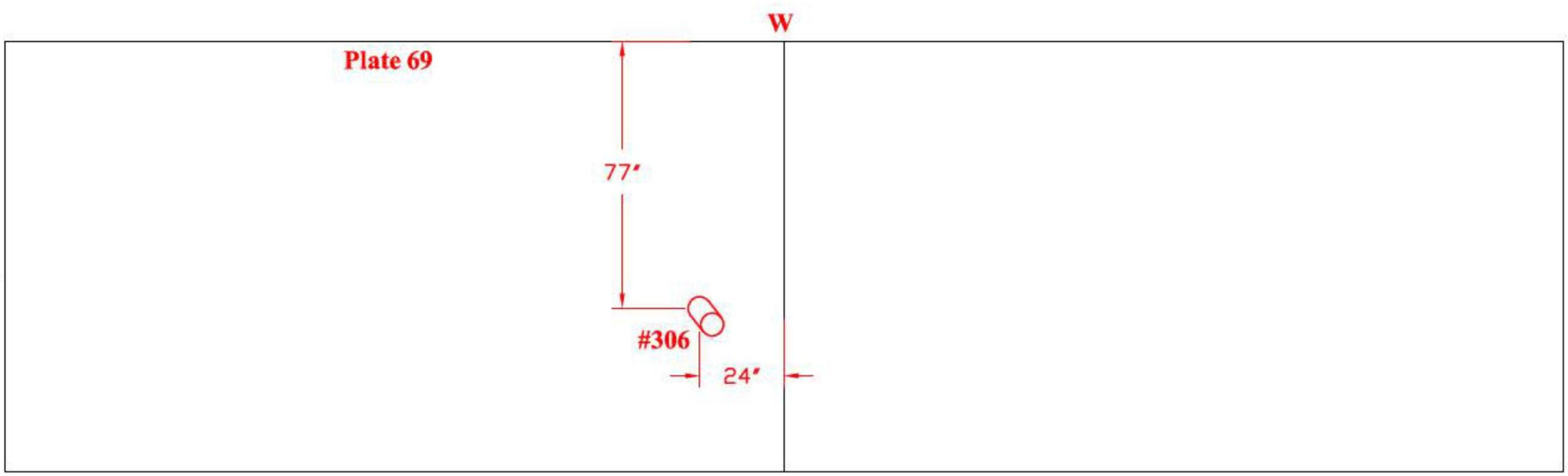
#305 - LOF - 0.127"D 5"L



Tank Section:Upper Dome
Quadrant: D

Course: A
Plate #: 69
Flaw # - Type - Remaining:

#306 - Grout Nozzle - 0.200"R



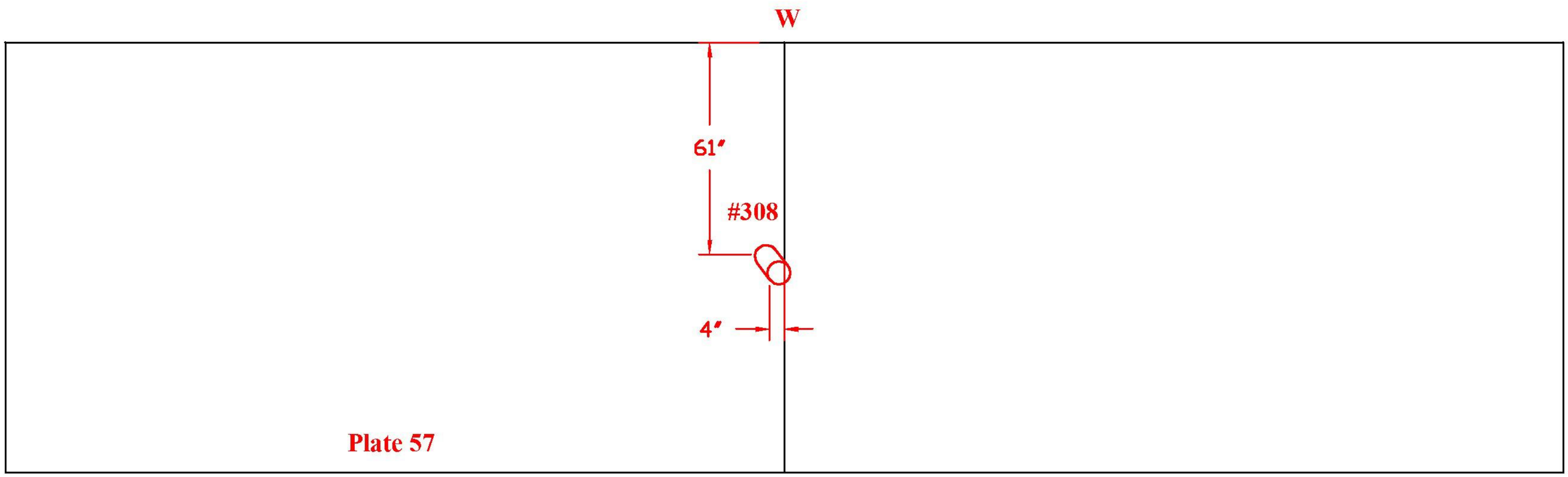
Drawing is not to scale

TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 57
Flaw # - Type - Remaining:

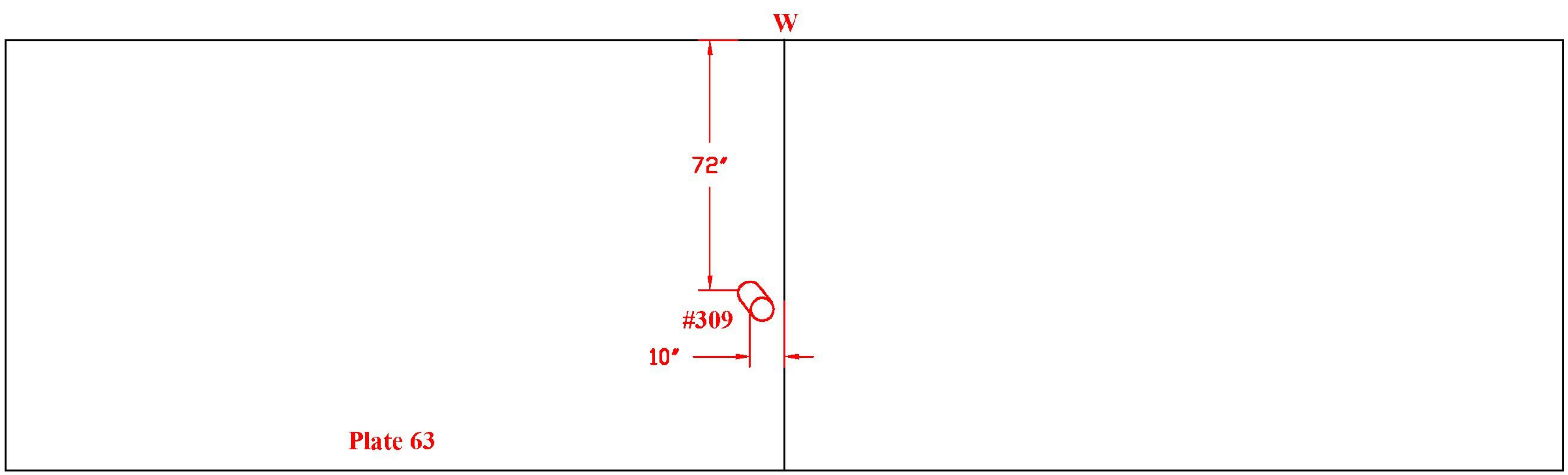
#308 - Grout Nozzle - 0.211"R



Tank Section:Upper Dome
Quadrant: D

Course: A
Plate #: 63
Flaw # - Type - Remaining:

#309 - Grout Nozzle - 0.213"R



Drawing is not to scale

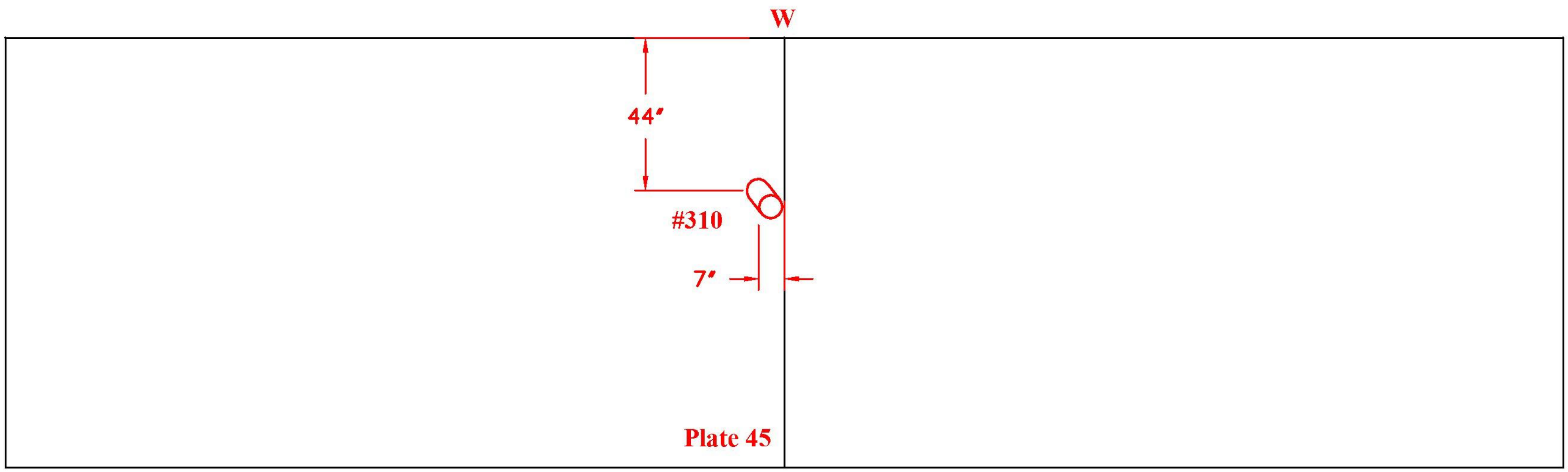
TANK # 20 - QUADRANT C

**Nominal Plate Thickness: 0.250"*

Tank Section: Upper Dome
Quadrant: C

Course: A
Plate #: 45
Flaw # - Type - Remaining:

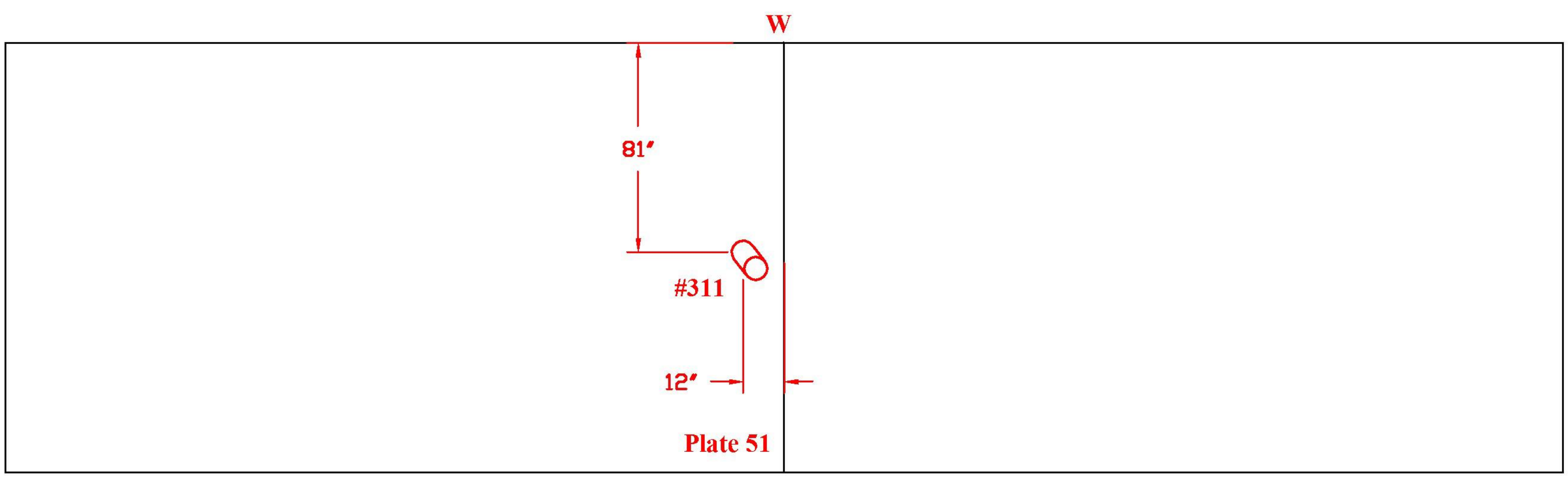
#310 - Gruot Nozzle - 0.203"R



Tank Section:Upper Dome
Quadrant:

Course: A
Plate #: 51
Flaw # - Type - Remaining:

#311 - Gruot Nozzle - 0.225"R



Drawing is not to scale

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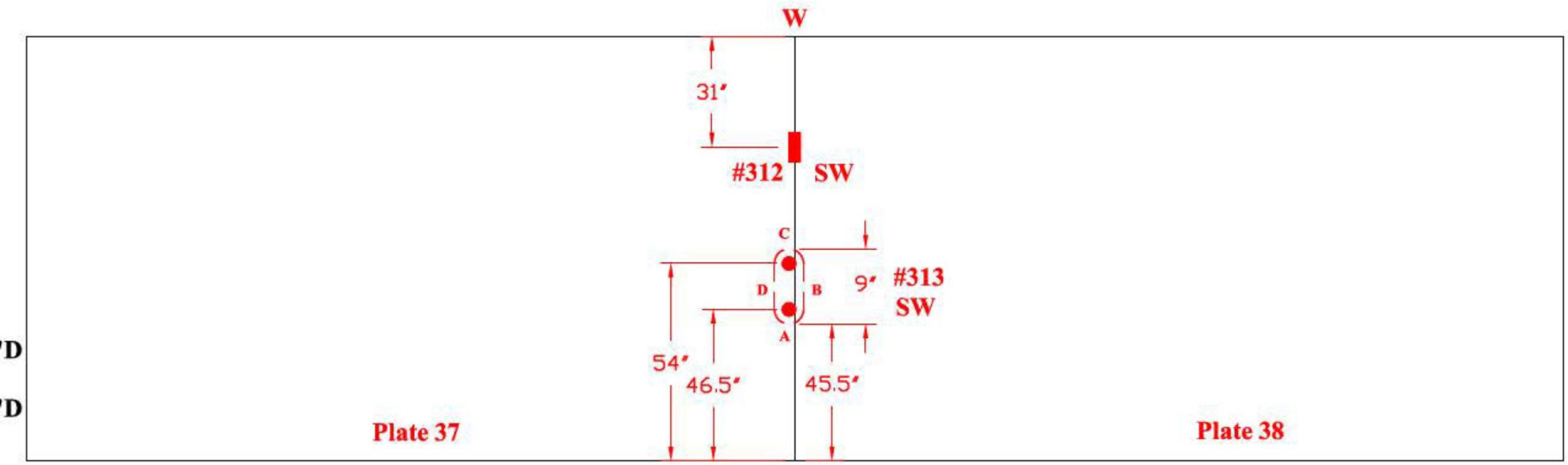
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: A
Plate #: 37
Flaw # - Type - Remaining:

#312 - LOF - 0.115"D 2"L

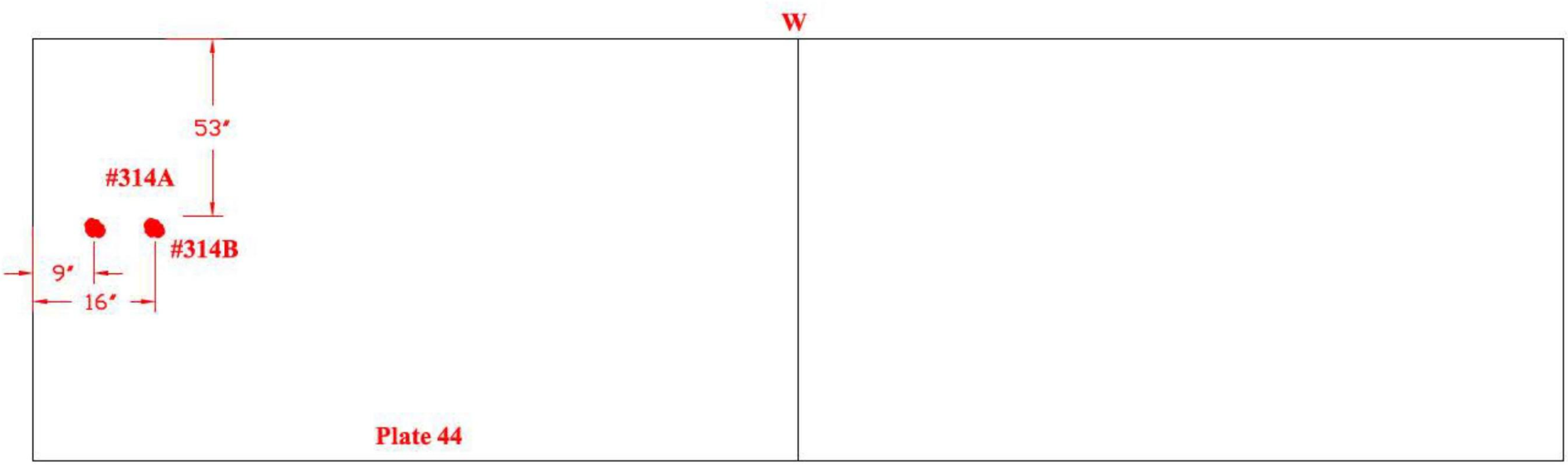
#313
(A) Pit - 0.125"dia 0.213"D
(B) LOF - 0.109"D 9"L
(C) Pit - 0.125"dia 0.194"D
(D) LOF - 0.071"D 9"L



Tank Section:Upper Dome
Quadrant: C

Course: A
Plate #: 44
Flaw # - Type - Remaining:

#314 - LOF - BM - 0.100"D 2"L
- LOF - BM - 0.126"D 2"L



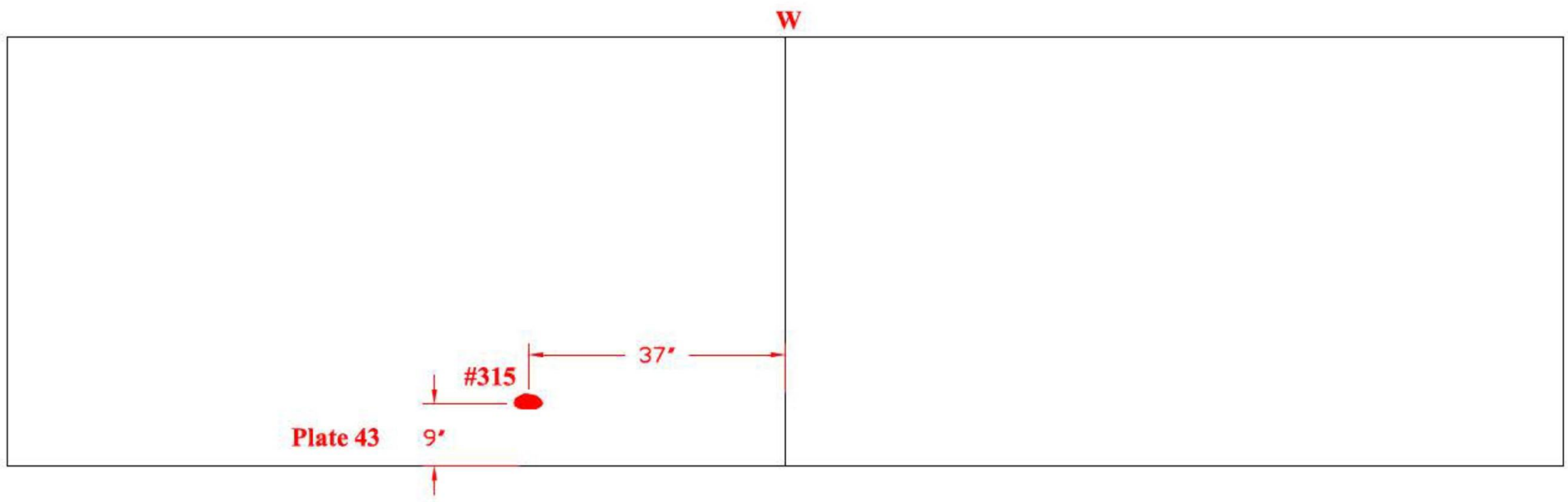
Drawing is not to scale

TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: A
Plate #: 43
Flaw # - Type - Remaining:

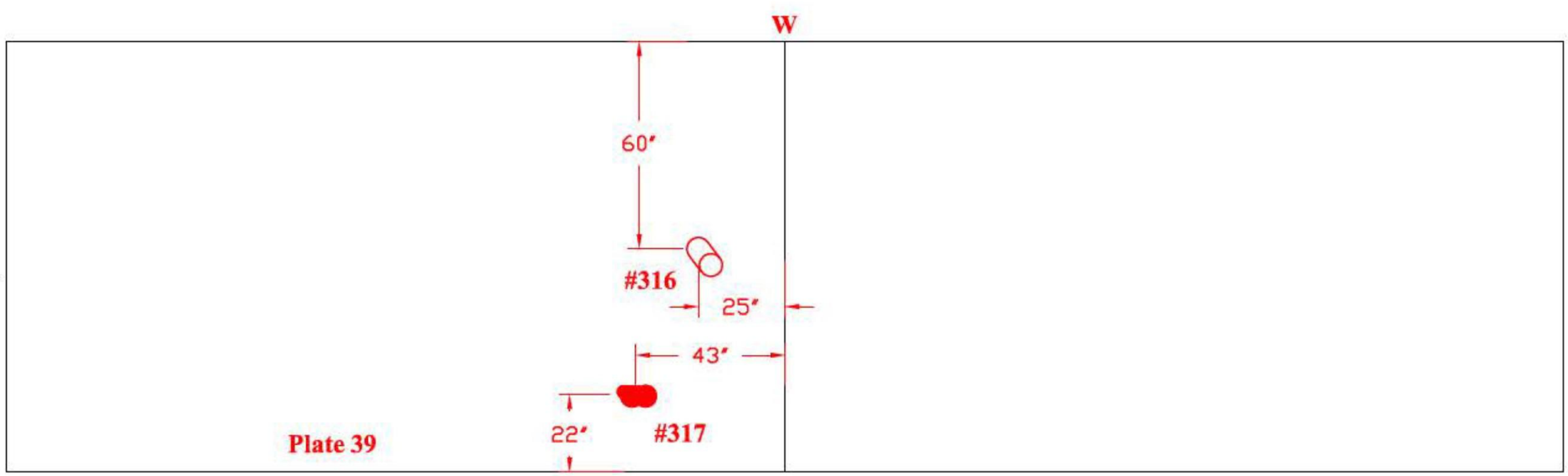
#315 - Dent - 0.200 deep



Tank Section:Upper Dome
Quadrant: A

Course: A
Plate #: 39
Flaw # - Type - Remaining:

#316 - Grout Nozzle - 0.200"R
#317 - Dent - 0.200"deep



Drawing is not to scale

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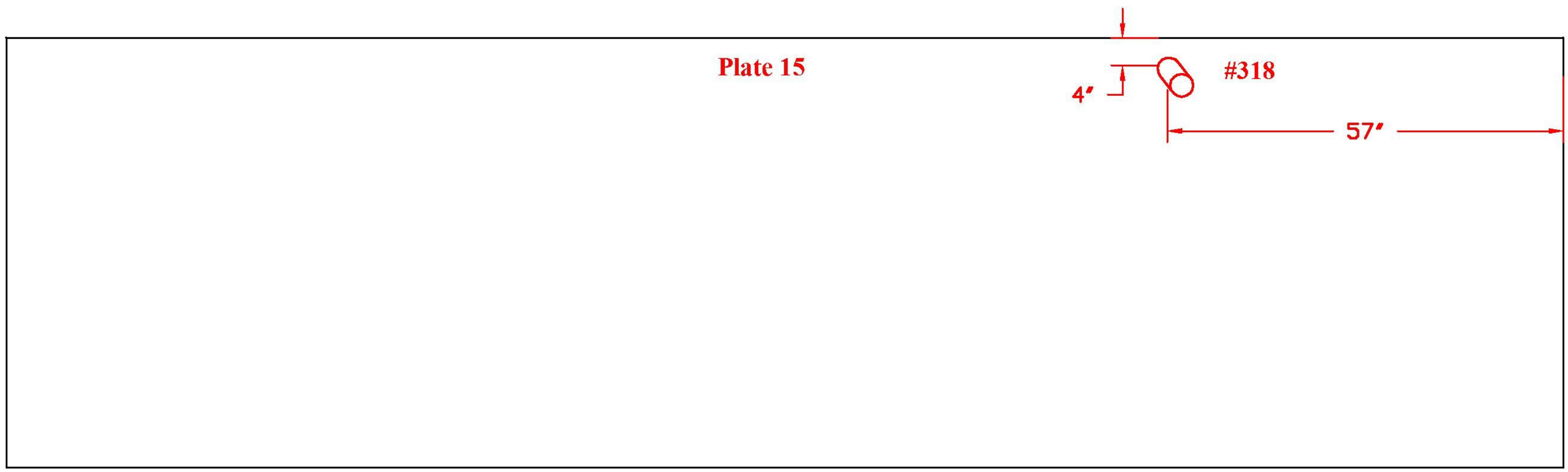
TANK # 20 - QUADRANT A

Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: A
Plate #: 15
Flaw # - Type - Remaining:

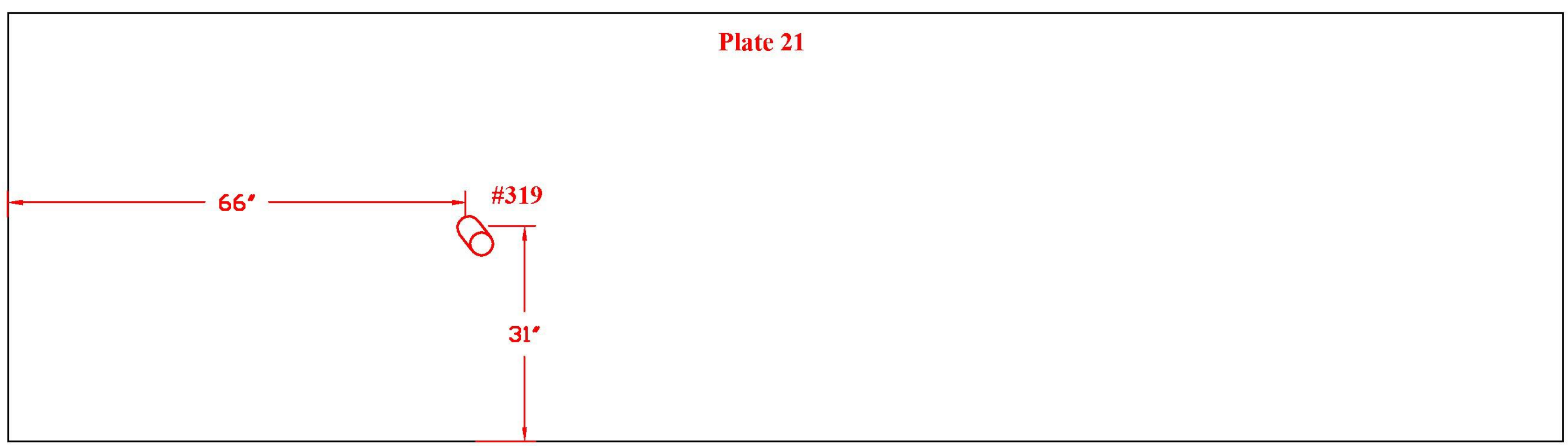
#318 - Grout Nozzle - 0.230"R



Tank Section:Upper Dome
Quadrant: A

Course: A
Plate #: 21
Flaw # - Type - Remaining:

#319 - Grout Nozzle - 0.206"R



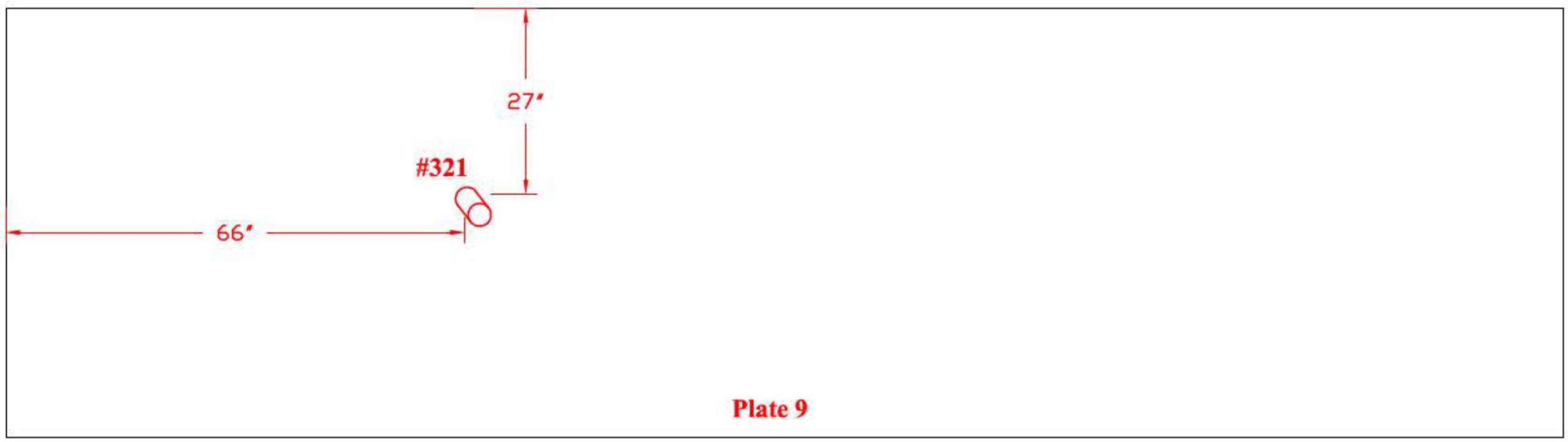
Drawing is not to scale

TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section:Upper Dome
Quadrant: A

Course: A
Plate #: 9
Flaw # - Type - Remaining:

#321 - Grout Nozzle - 0.217"R



Drawing is not to scale

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TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: A

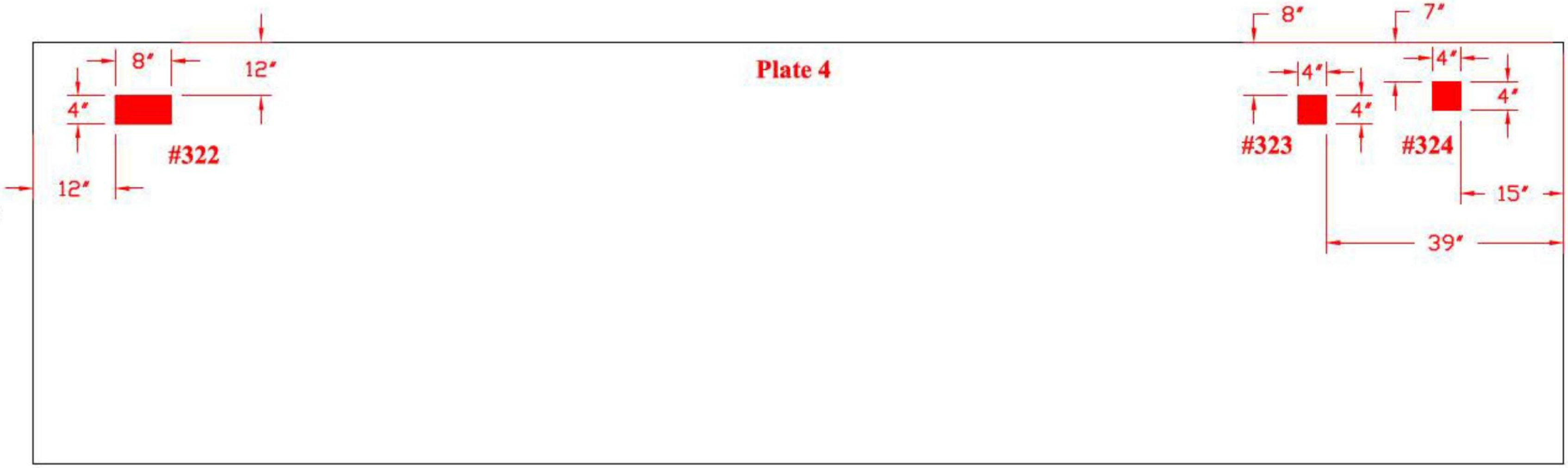
Course: 3
Plate #: 4

Flaw # - Type - Remaining:

#322 - WL - 0.220"R

#323 - WL - 0.230"R

#324 - WL - 0.220"R



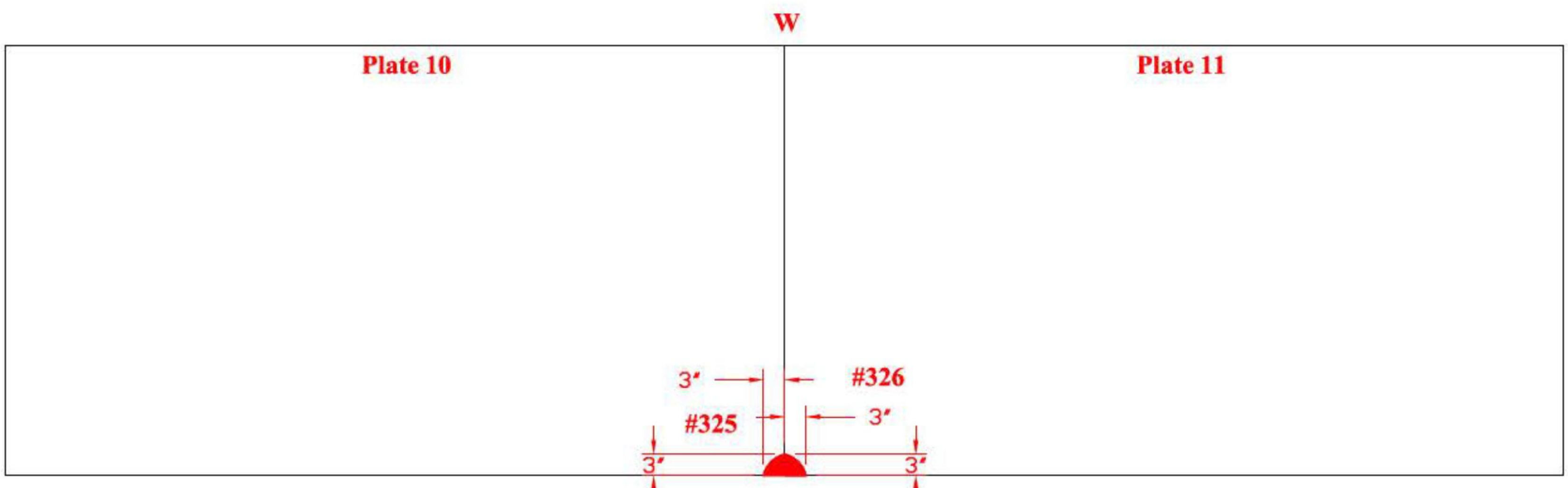
Tank Section: Extension
Quadrant: A

Course: A
Plate #: 10/11

Flaw # - Type - Remaining:

#325 - WL - 0.137"R

#326 - WL - 0.197"R



Drawing is not to scale

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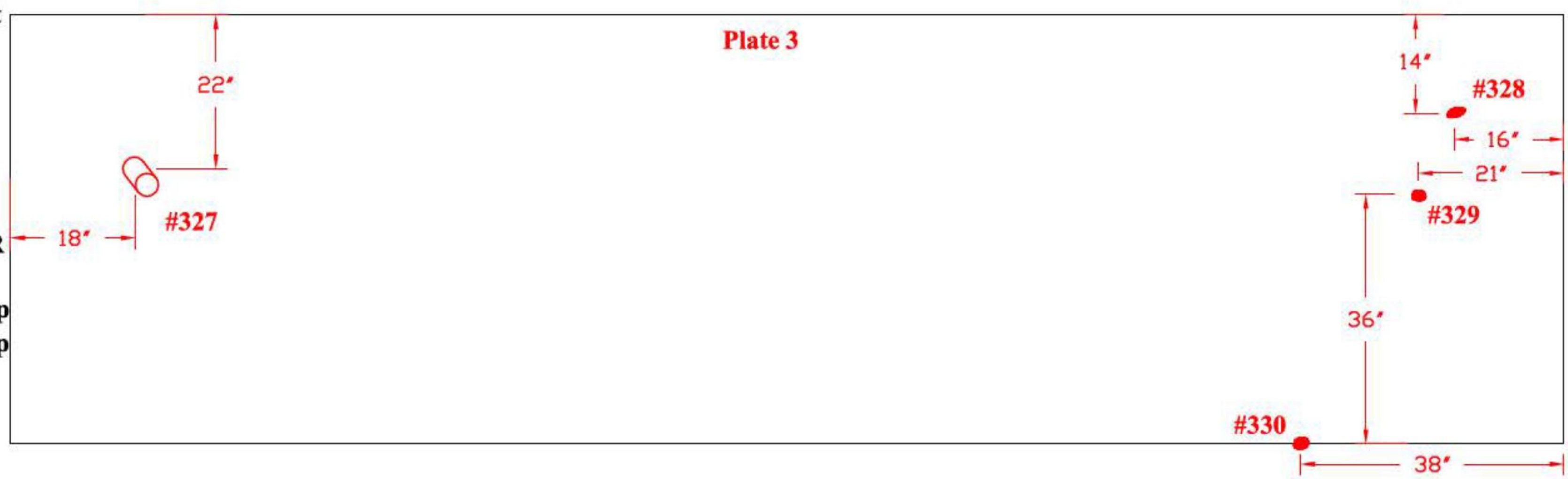
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Expansion Joint
Quadrant: A

Course: 2
Plate #: 3
Flaw # - Type - Remaining:

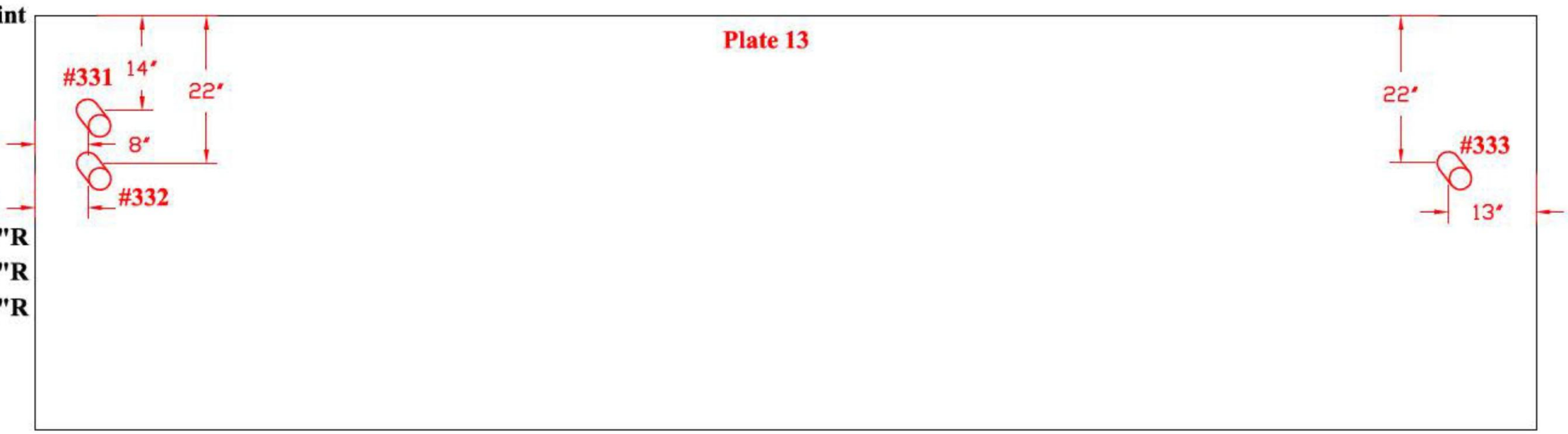
#327 - Grout Nozzle - 0.201"R
#328 - Dent - 0.160" deep
#329 - Arc Gouge - 0.160"deep
#330 - Arc Gouge - 0.160"deep



Tank Section: Expansion Joint
Quadrant: B

Course: 2
Plate #: 13
Flaw # - Type - Remaining:

#331 - Grout Nozzle - 0.222"R
#332 - Grout Nozzle - 0.219"R
#333 - Grout Nozzle - 0.215"R



Drawing is not to scale

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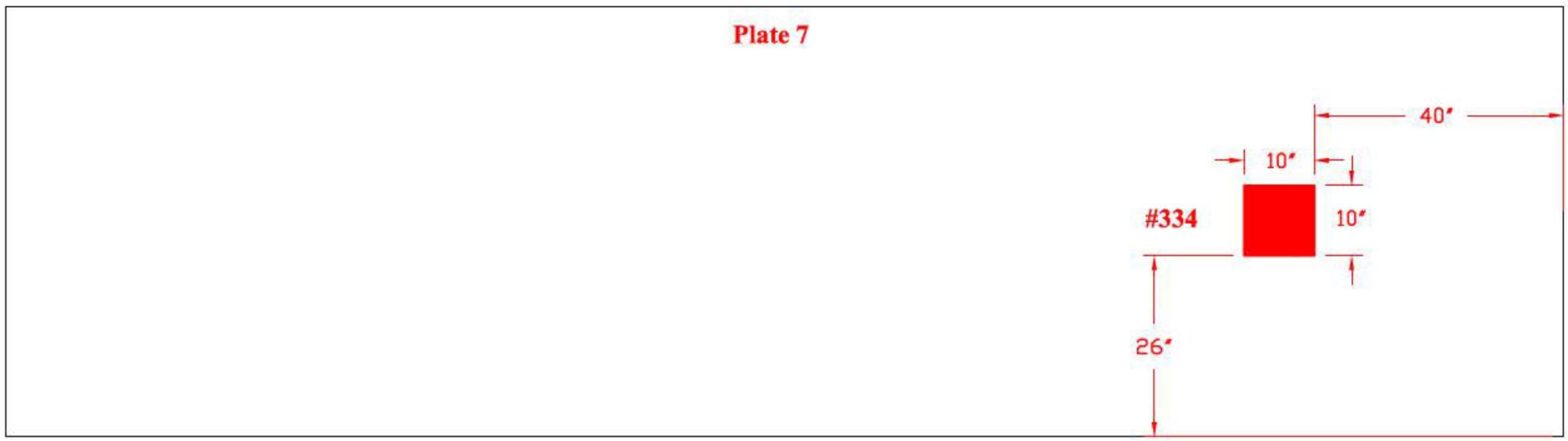
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: A

Course: 2
Plate #: 7

Flaw # - Type - Remaining:

#334 - WL - 0.137"R

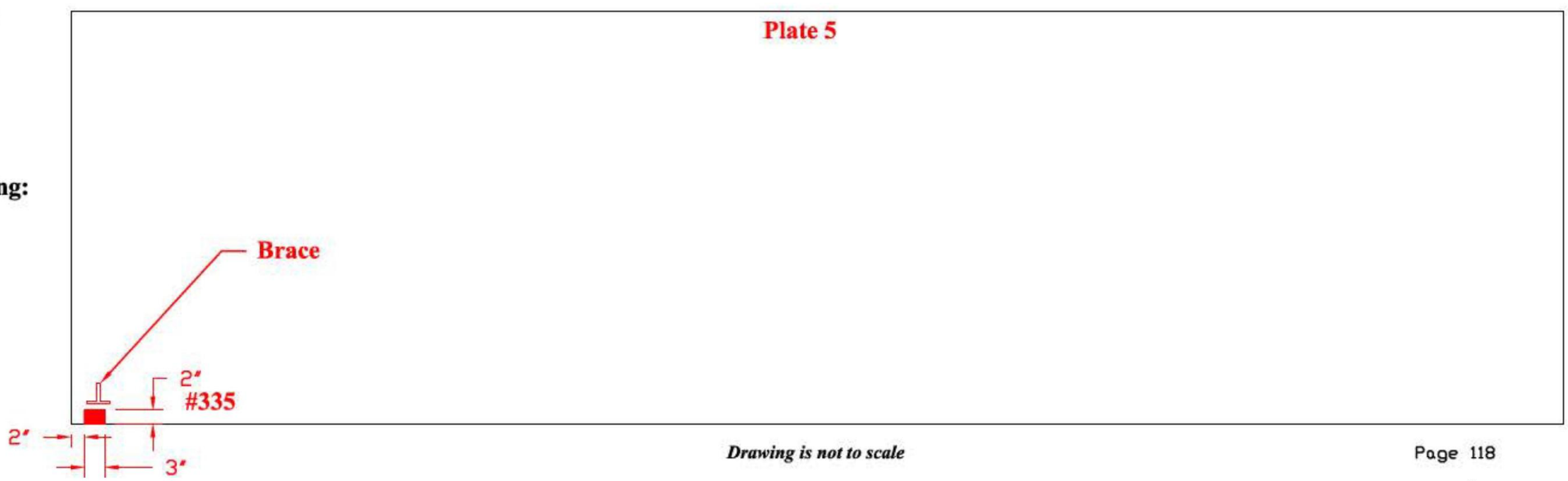


Tank Section: Extension
Quadrant: A

Course: 3
Plate #: 5

Flaw # - Type - Remaining:

#335 - WL - 0.208"R



Drawing is not to scale

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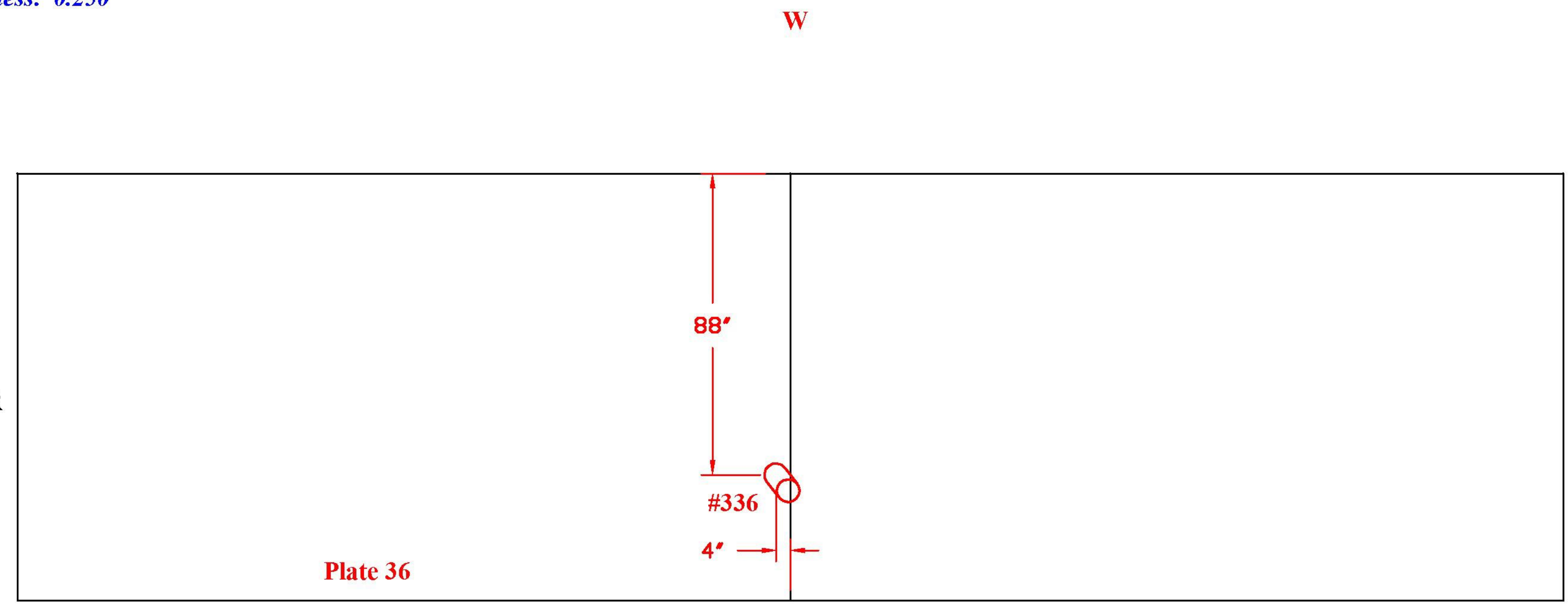
TANK # 20 - QUADRANT C

***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: C

Course: B
Plate #: 36
Flaw # - Type - Remaining:

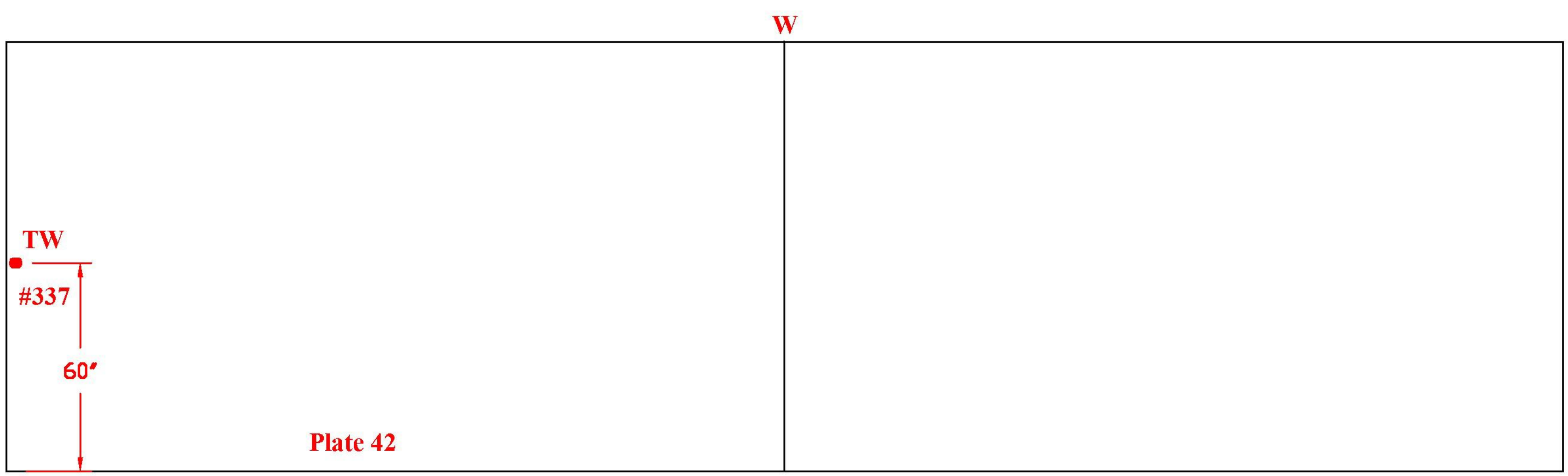
#336 - Grout Nozzle - 0.197"R



Tank Section:Upper Dome
Quadrant: C

Course: B
Plate #: 42
Flaw # - Type - Remaining:

#337 - TW-LOF-0.140"D 1"L



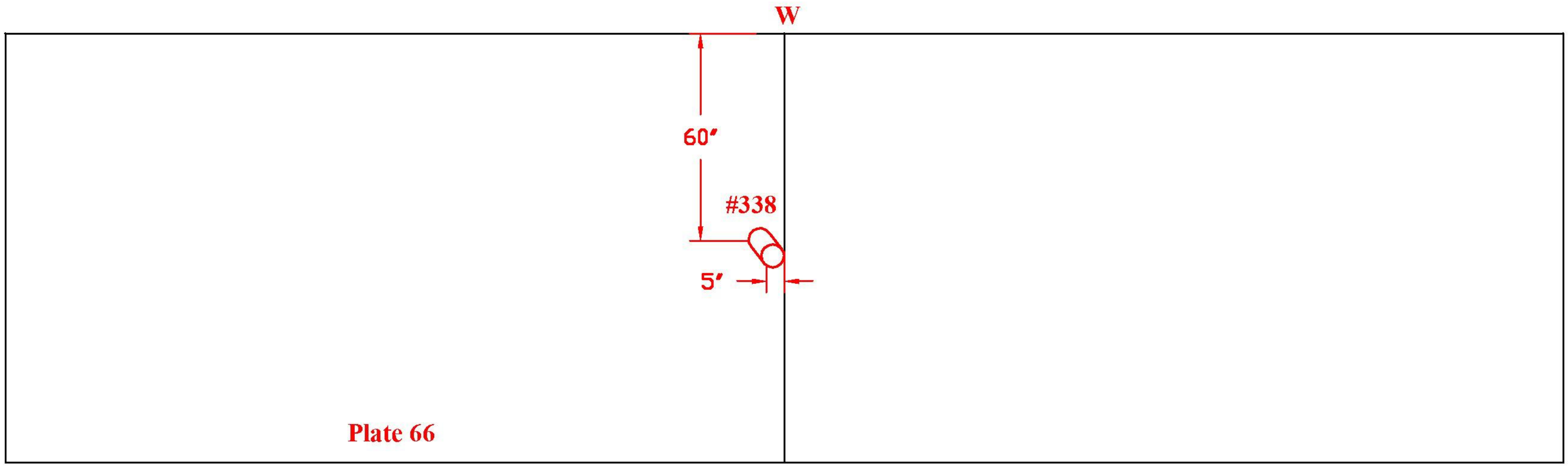
Drawing is not to scale

TANK # 20 - QUADRANT D
**Nominal Plate Thickness: 0.250"*

Tank Section: Upper Dome
Quadrant: D

Course: B
Plate #: 66
Flaw # - Type - Remaining:

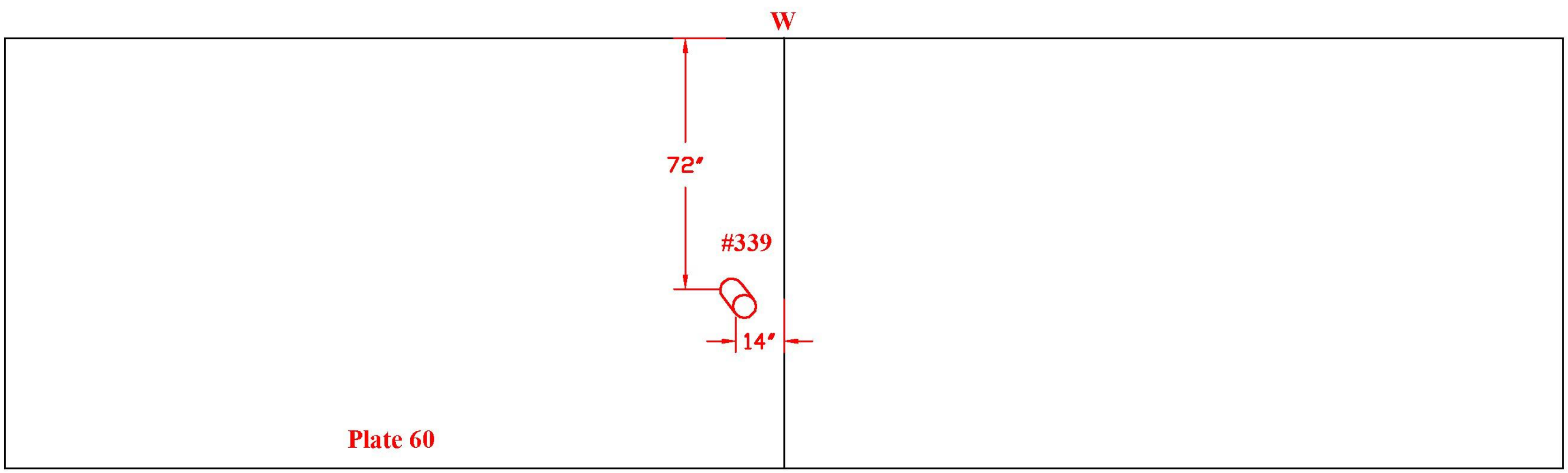
#338 - Grout Nozzle - 0.217"R



Tank Section:Upper Dome
Quadrant: D

Course: B
Plate #: 60
Flaw # - Type - Remaining:

#339 - Grout Nozzle - 0.218"R



Drawing is not to scale

TesTex
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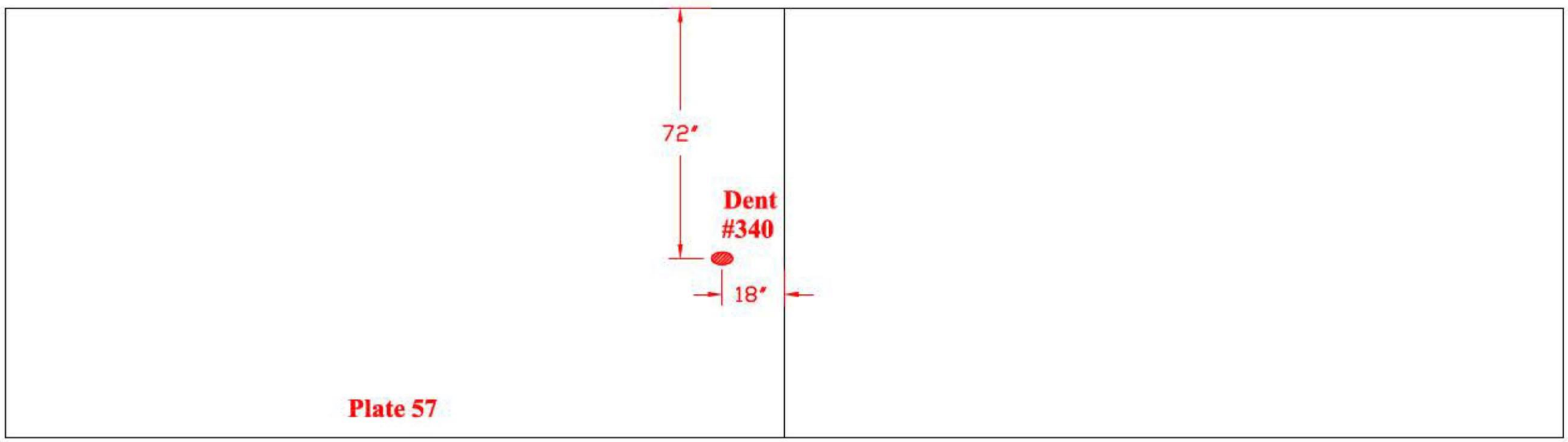
TANK # 20 - QUADRANT D
***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: D

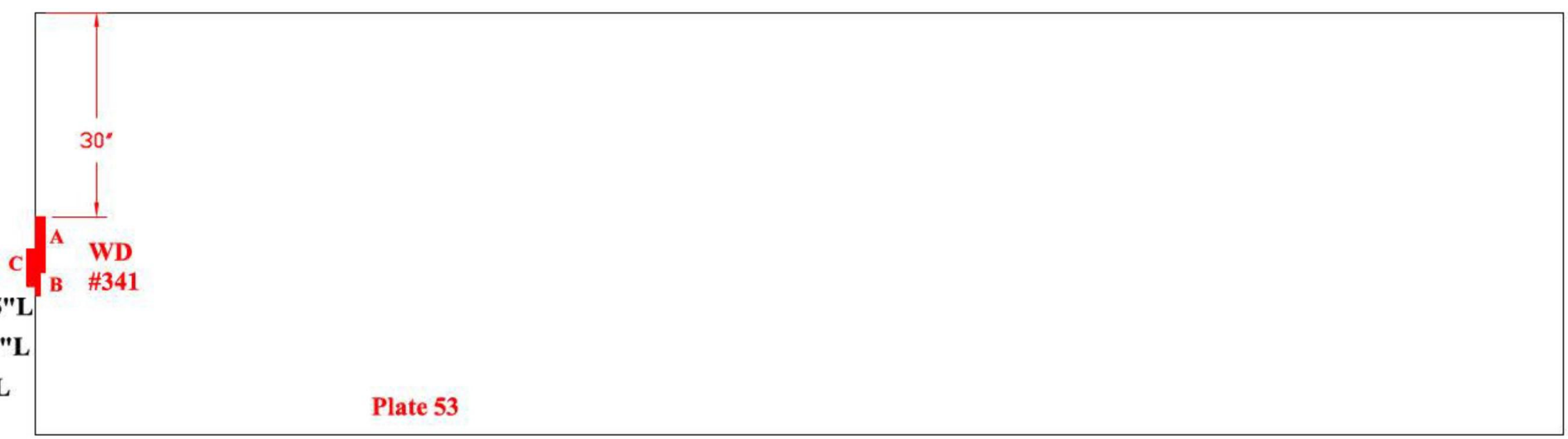
Course: B
Plate #: 57
Flaw # - Type - Remaining:

#340 - Dent - 0.200" deep



Tank Section:Upper Dome
Quadrant: D

Course: B
Plate #: 53
Flaw # - Type - Remaining:



#341: - A) LOF - 0.083"D 6.5"L
B) LOF - 0.217"D 1.5"L
C) LOF - 0.064"D 7"L

Drawing is not to scale

TesTex
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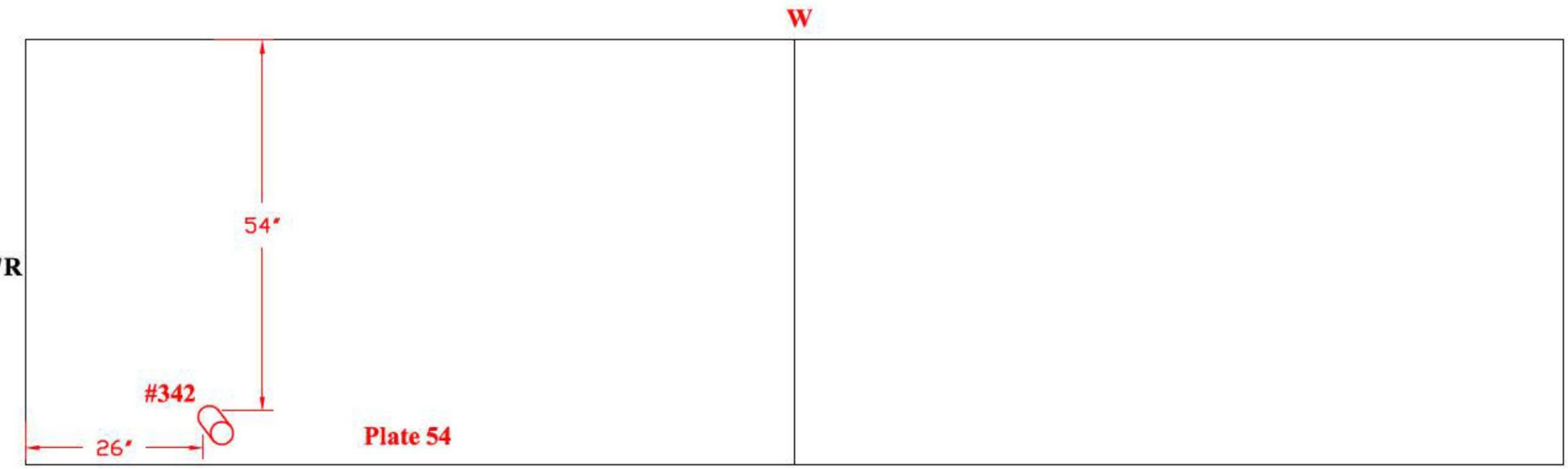
TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: B
Plate #: 54
Flaw # - Type - Remaining:

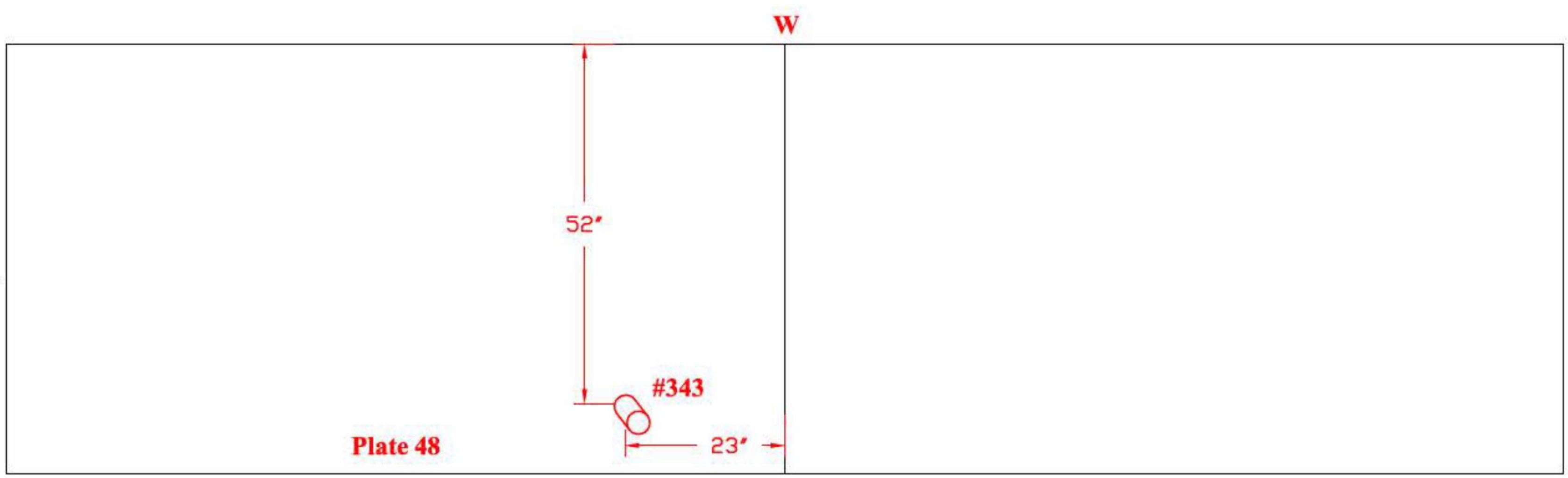
#342 - Grout Nozzle - 0.206"R



Tank Section:Upper Dome
Quadrant: C

Course: B
Plate #: 48
Flaw # - Type - Remaining:

#343 - Grout Nozzle - 0.212"R



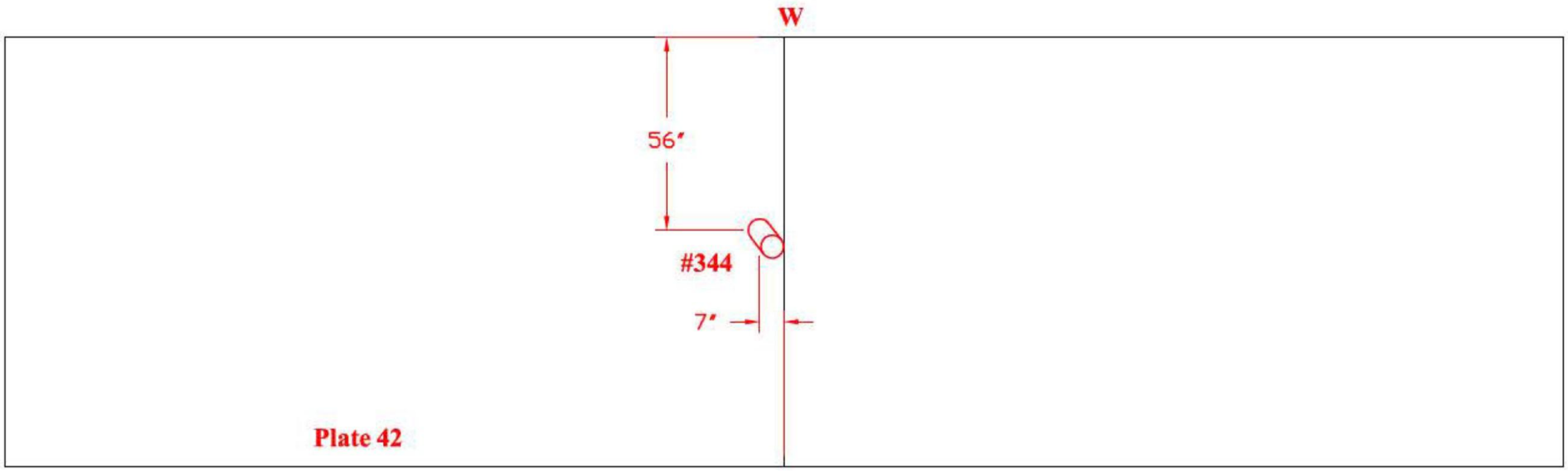
Drawing is not to scale

TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: B
Plate #: 42
Flaw # - Type - Remaining:

#344 - Grout Nozzle - 0.212"R



Tank Section: Upper Dome
Quadrant: C

Course: B
Plate #: 39
Flaw # - Type - Remaining:

#345 - LOF - 0.169"D 3"L

Drawing is not to scale

TesTex
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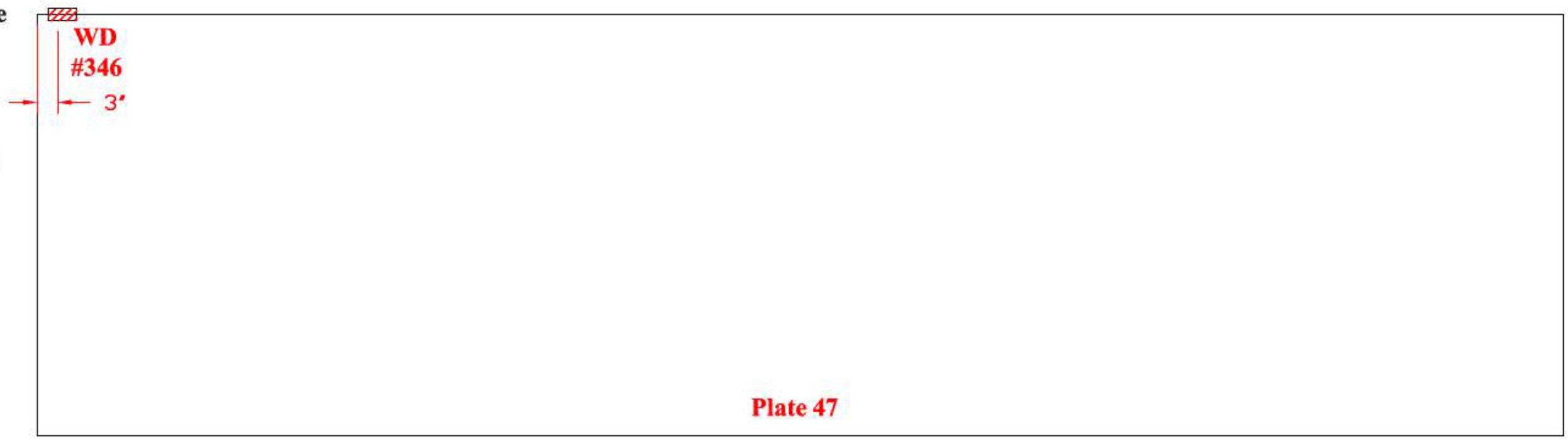
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: B
Plate #: 47
Flaw # - Type - Remaining:

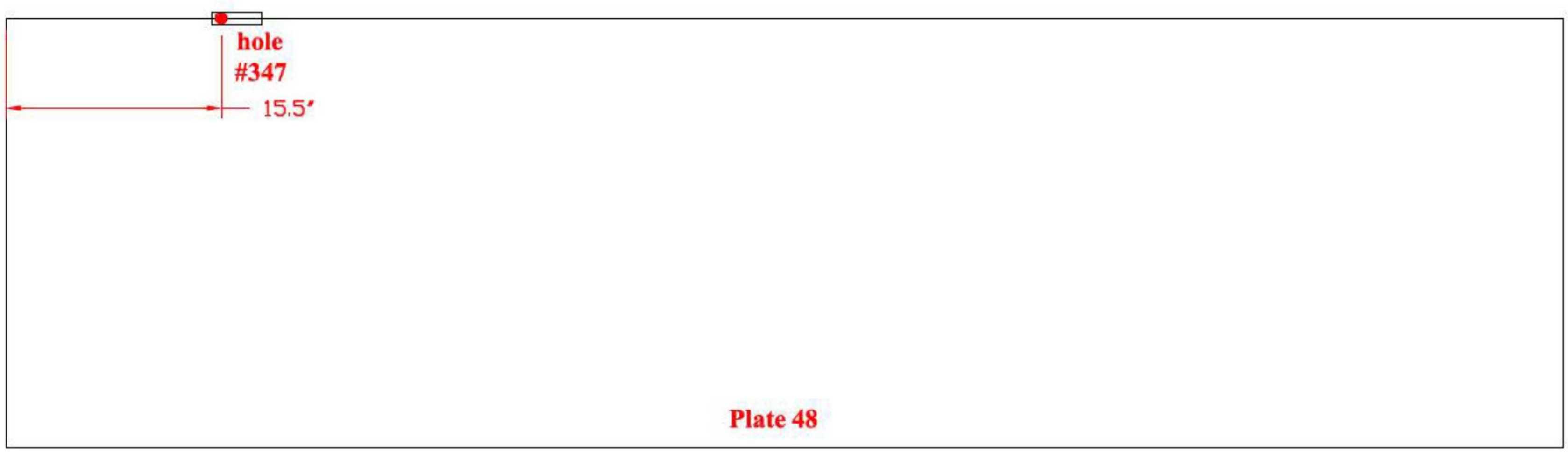
#346
A) - LOF - 0.188"D 2.5"L
B) - LOF - 0.221"D 2"L



Tank Section:Upper Dome
Quadrant: C

Course: B
Plate #: 48
Flaw # - Type - Remaining:

#347 - Hole - BS - 0.500"dia
Thru-wall 0.244"D



Drawing is not to scale

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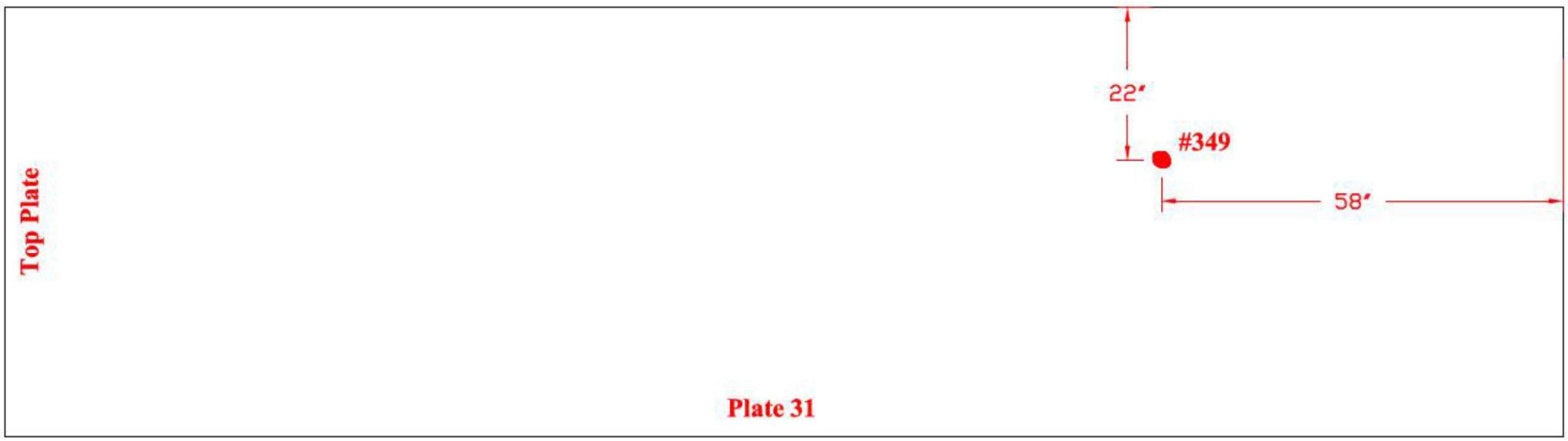
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #: 31
Flaw # - Type - Remaining:

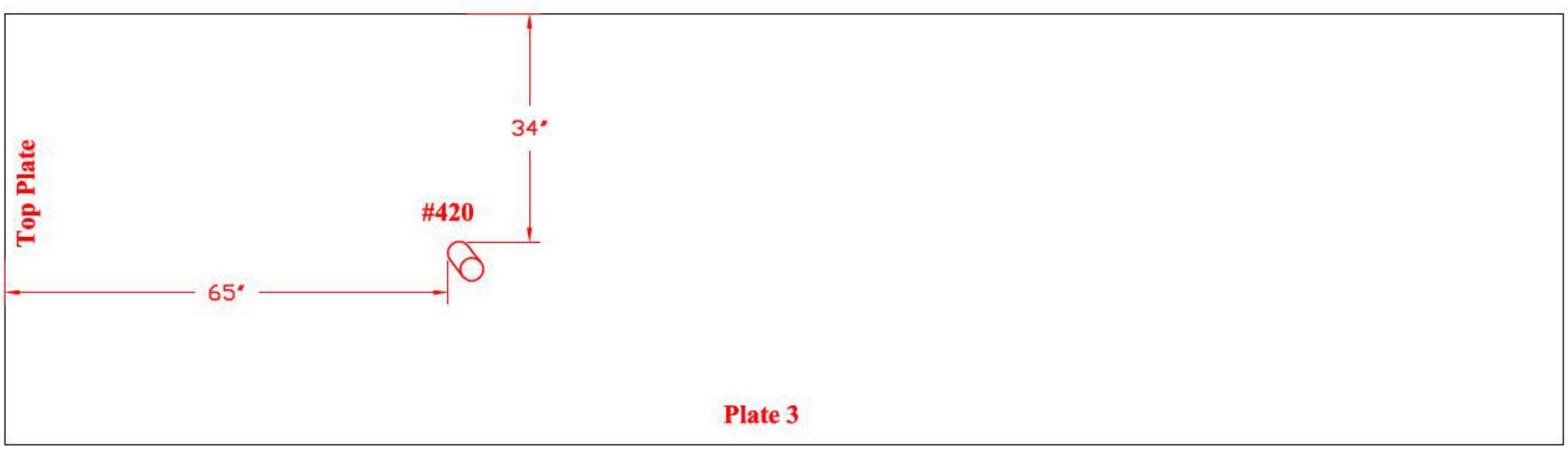
#349 - Dent - 0.160" deep



Tank Section:Upper Dome
Quadrant: A

Course: A
Plate #: 3
Flaw # - Type - Remaining:

#420 - Grout Nozzle - 0.230"R



Drawing is not to scale

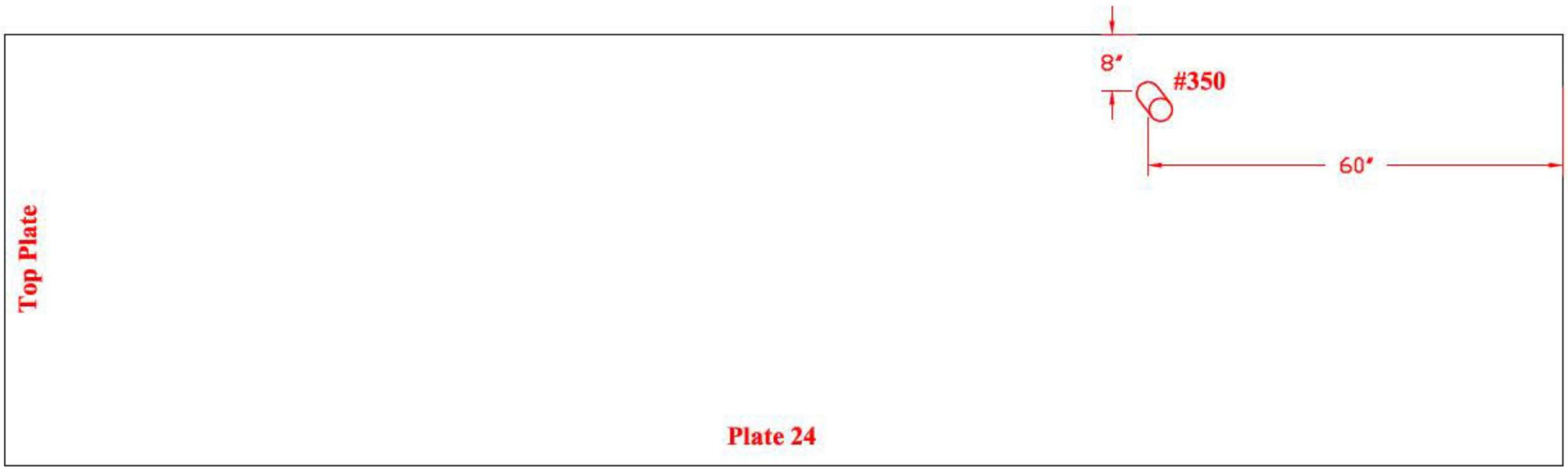
TANK # 20 - QUADRANT B
***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #: 24

Flaw # - Type - Remaining:

#350 - Grout Nozzle - 0.221"R

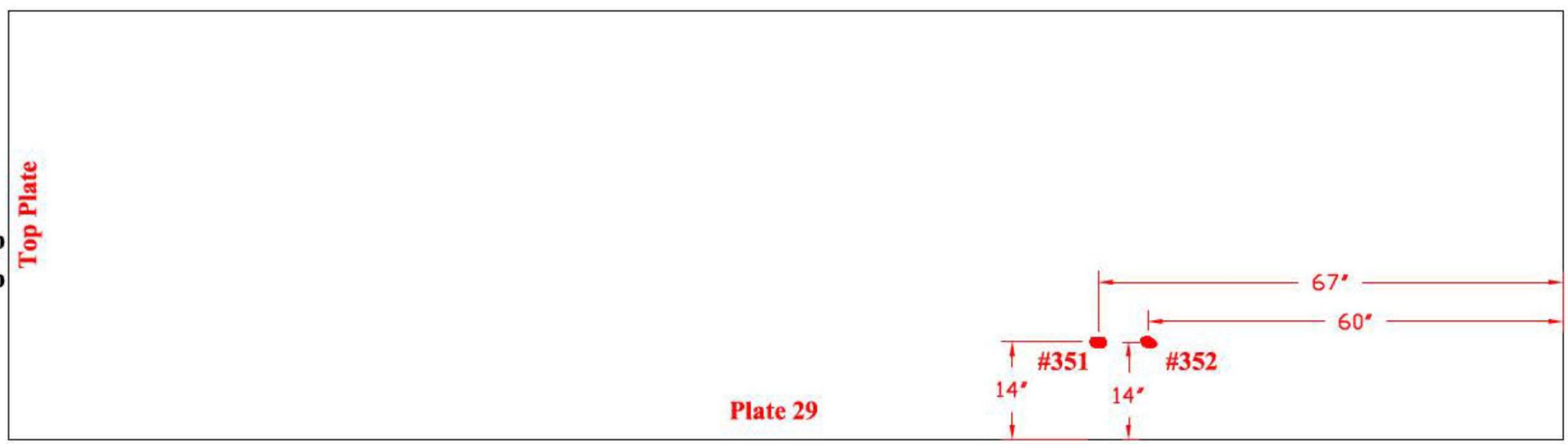


Tank Section:Upper Dome
Quadrant: B

Course: B
Plate #: 29

Flaw # - Type - Remaining:

#351 - Arc Gouge - 0.160"deep
#352 - Arc Gouge - 0.160"deep



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

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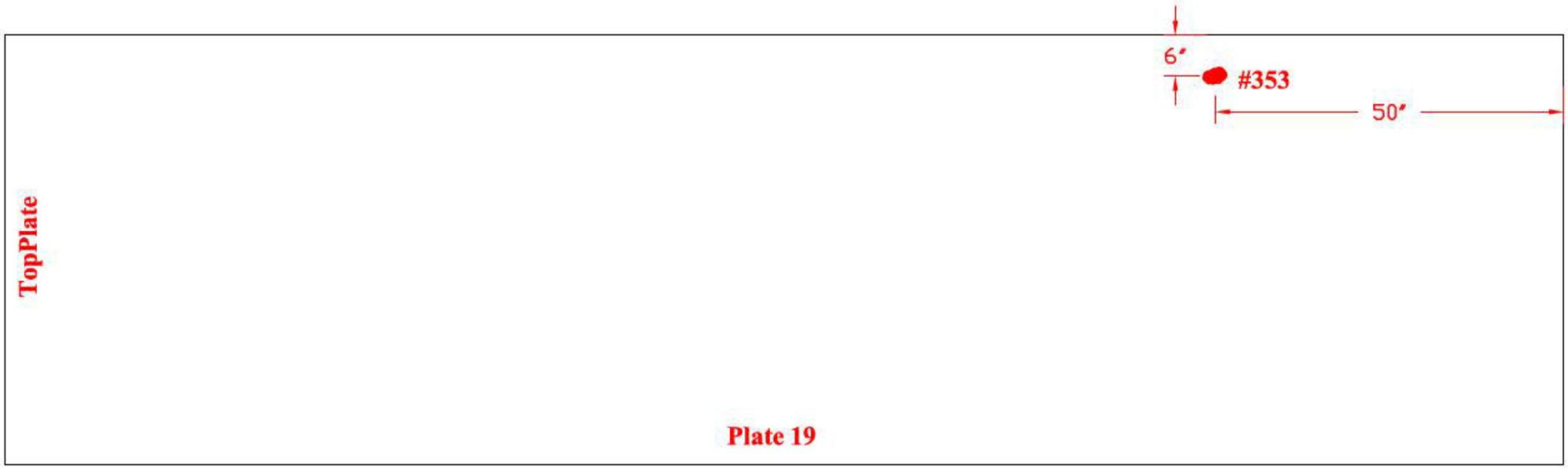
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #: 19

Flaw # - Type - Remaining:

#353-Arc Gouge - 0.160"Deep

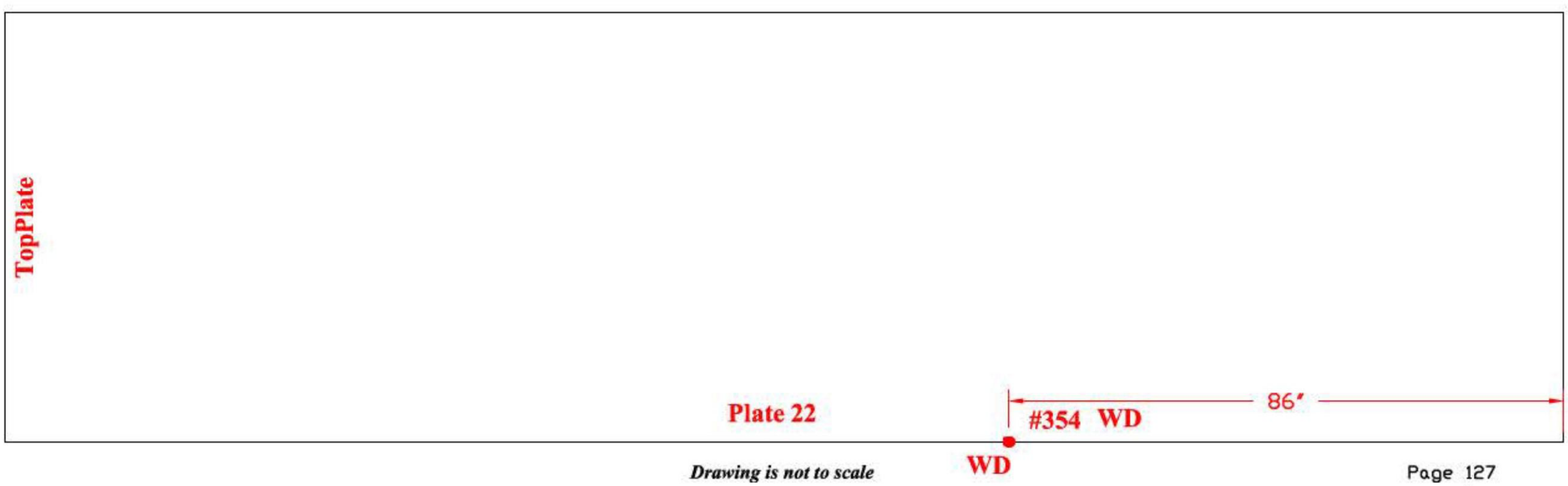


Tank Section:Upper Dome
Quadrant: B

Course: B
Plate #: 22

Flaw # - Type - Remaining:

#354 - Pit - 0.062"D - NRI
no significant depth



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

TesTex
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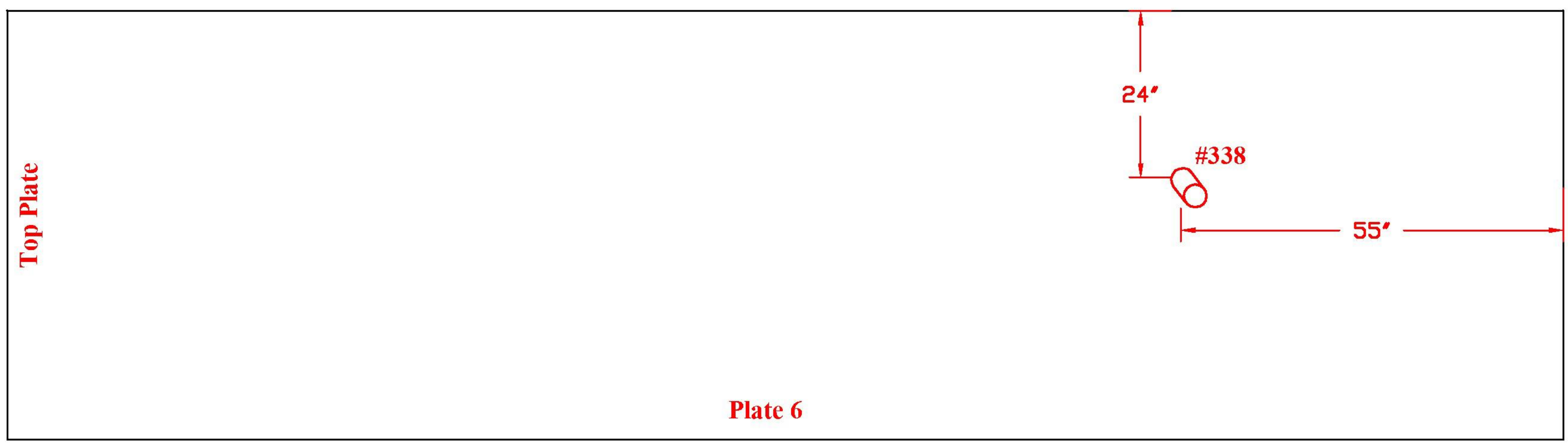
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: B
Plate #: 6

Flaw # - Type - Remaining:

#355 - Grout Nozzle - 0.214"R

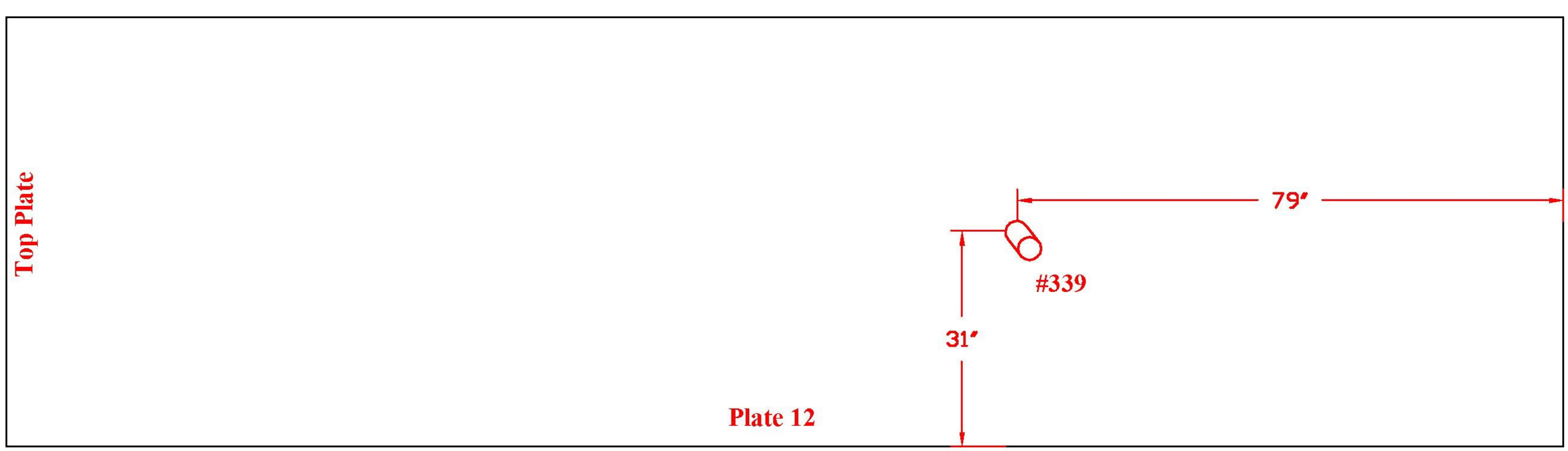


Tank Section:Upper Dome
Quadrant: A

Course: B
Plate #: 12

Flaw # - Type - Remaining:

#356 - Grout Nozzle - 0.210"R



Drawing is not to scale

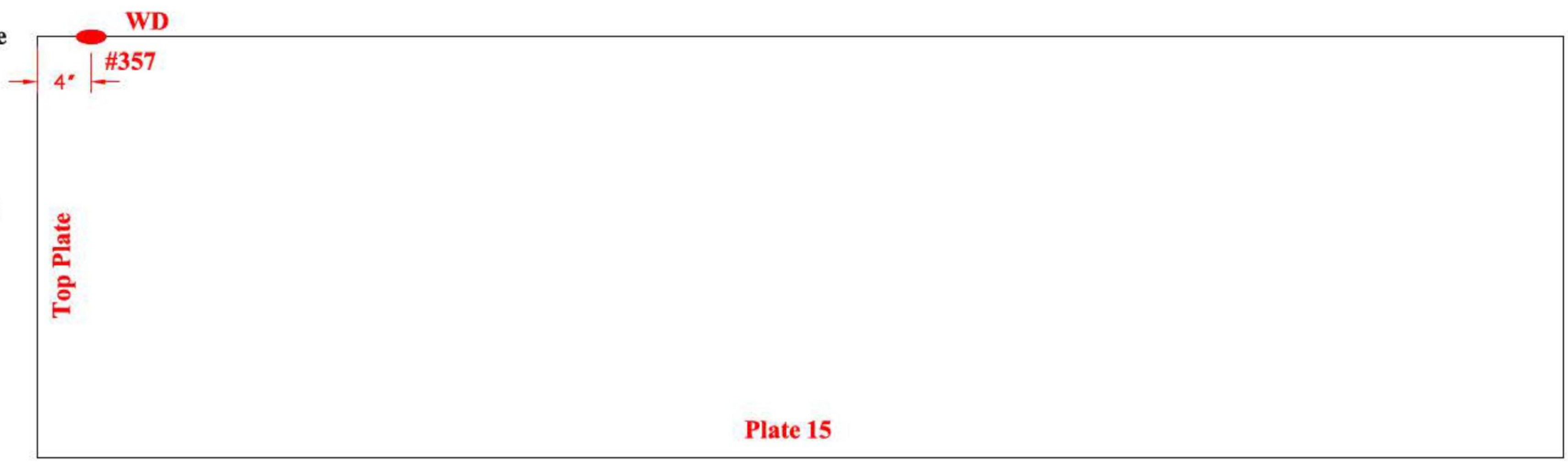
TANK # 20 - QUADRANT A
***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: A

Course: A
Plate #: 15

Flaw # - Type - Remaining:

#357 - Pits - .062"D

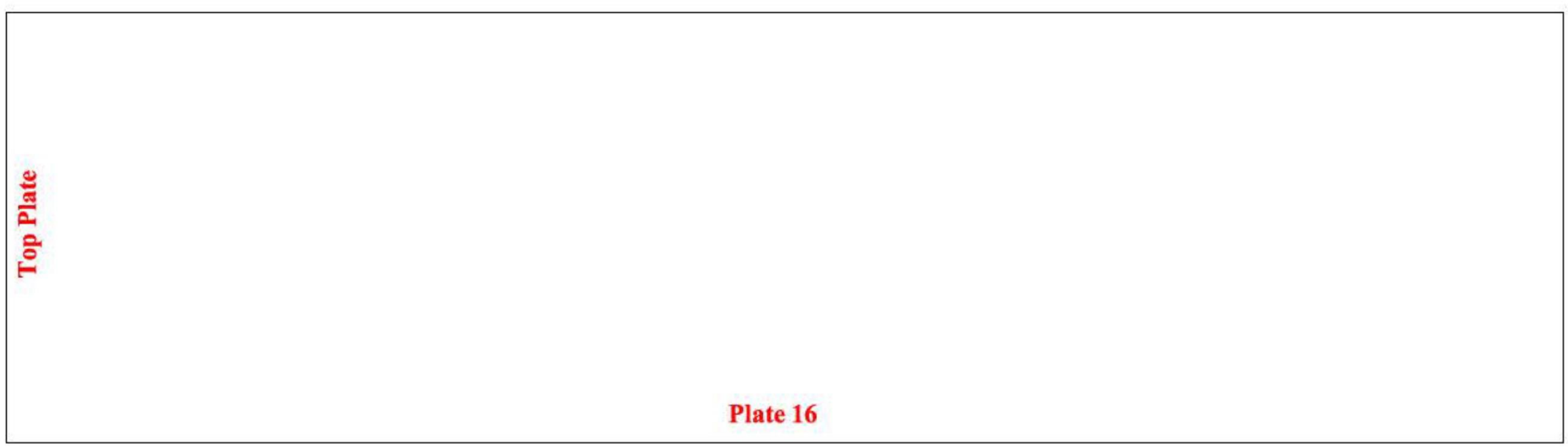


Tank Section:Upper Dome
Quadrant: A

Course: B
Plate #: 16

Flaw # - Type - Remaining:

#358
see #477



Drawing is not to scale

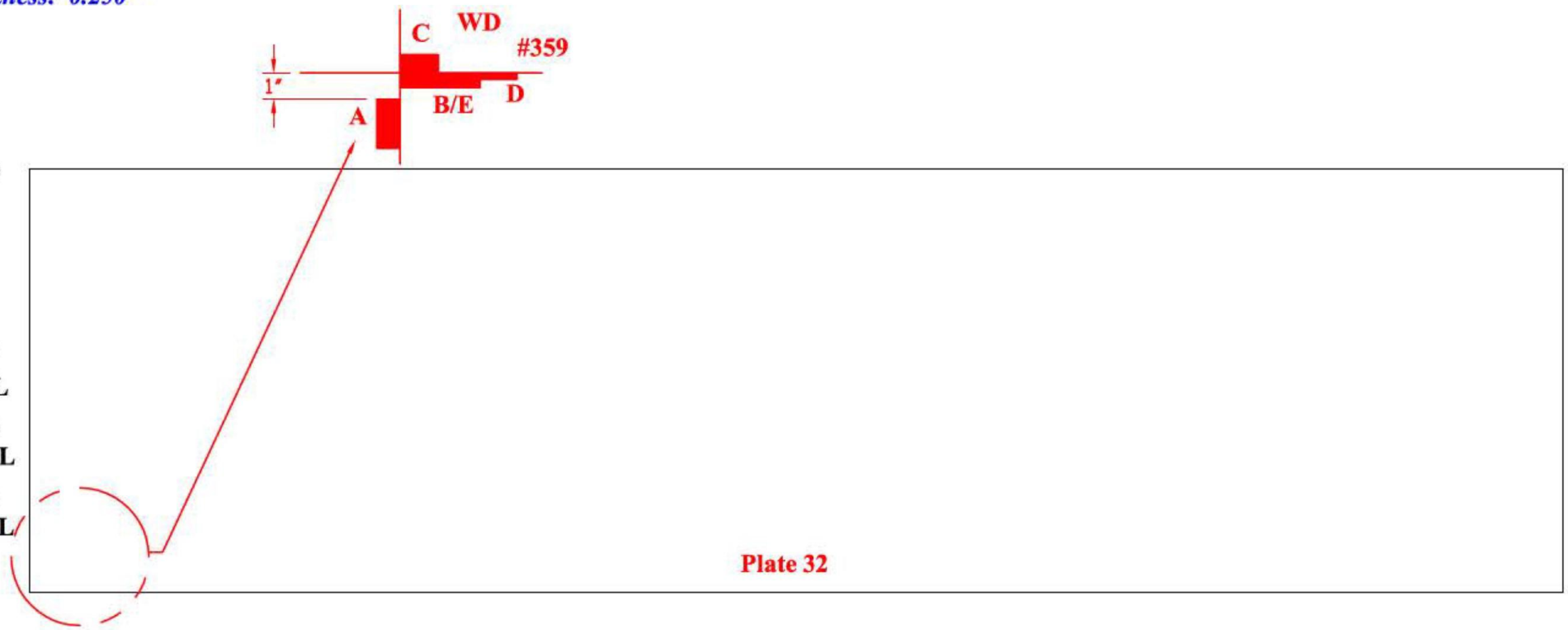
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: A
Plate #: 32

Flaw # - Type - Remaining:

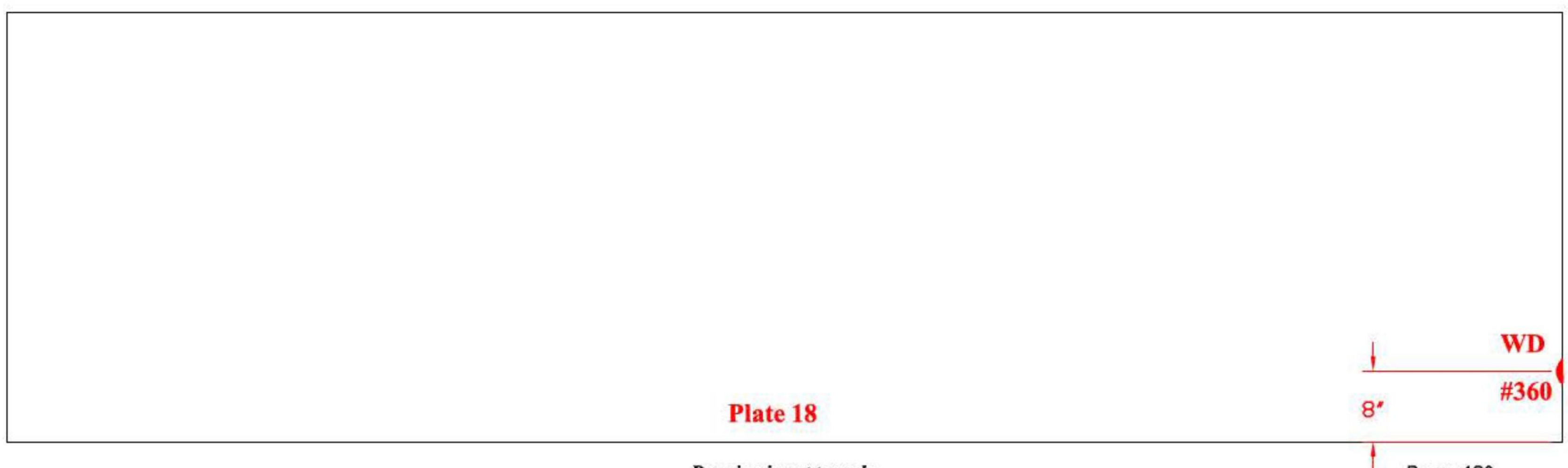
#359:A) LOF-0.206"D 1.5"L
B) LOF-0.104"D 3"L
C) LOF-0.214"D 1.5"L
D) LOF-0.111"D 4"L
E) LOF-0.110"D 2.5"L



Tank Section:Upper Dome
Quadrant: B

Course: A
Plate #: 18

Flaw # - Type - Remaining:
#360: LOF-0.217"D 3"L



Drawing is not to scale

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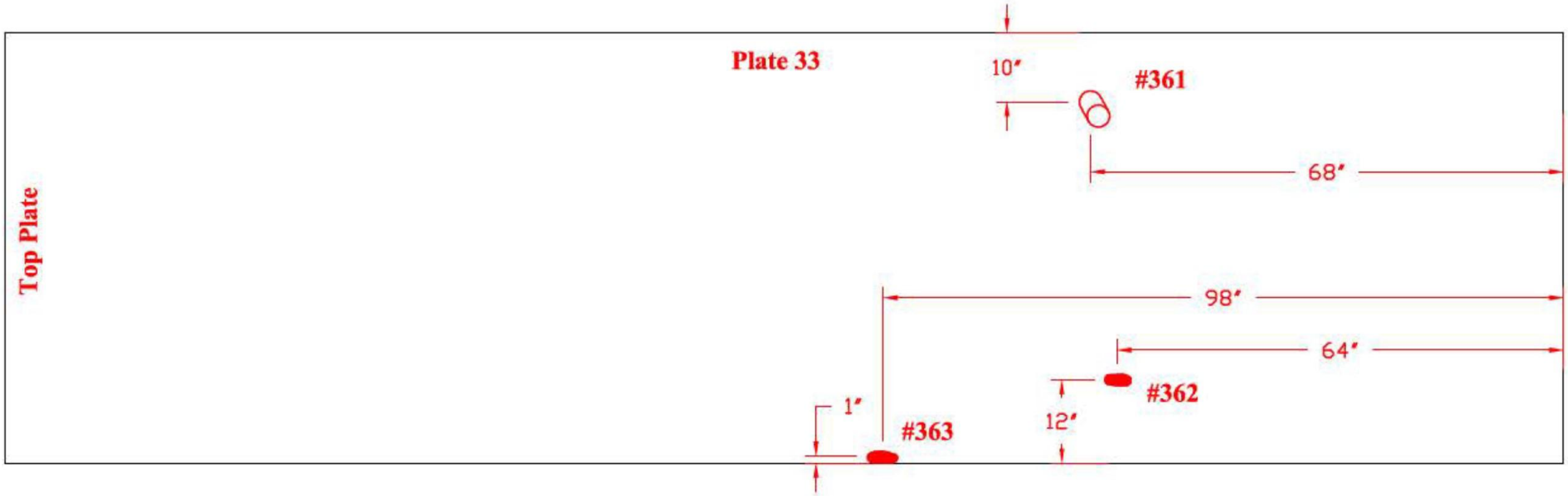
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: A
Plate #:33

Flaw # - Type - Remaining:

#361 - Grout Nozzle - 0.209"R
#362 - TW - 0.134"D
(LOF) - 1.5"L
#363 - TW - 0.169"D
(LOF) - 1.5"L

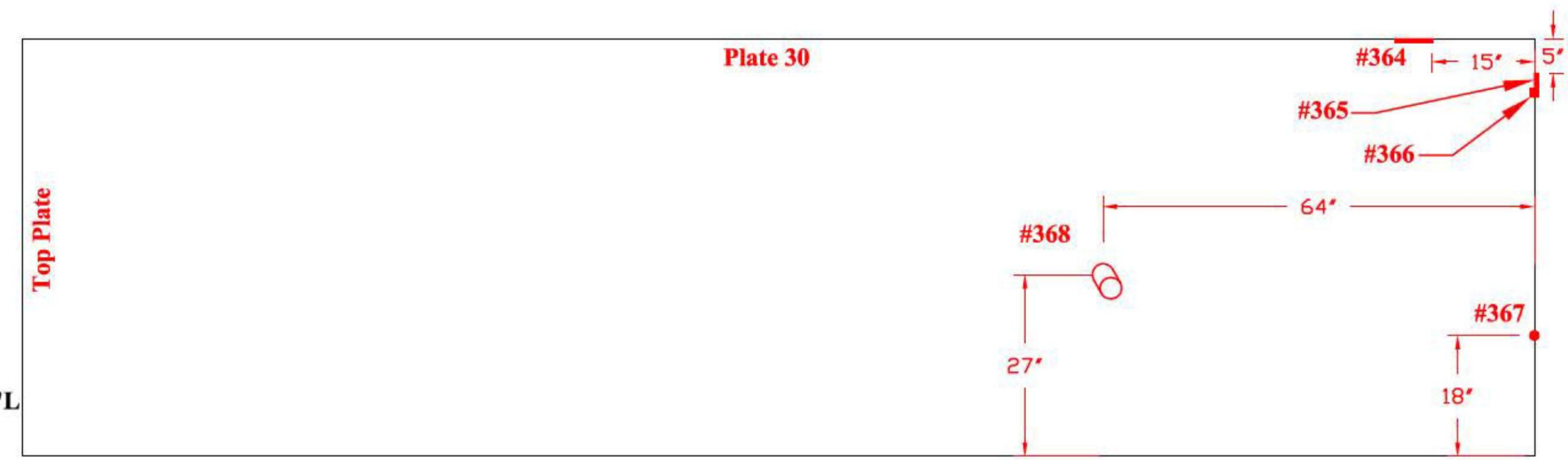


Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #: 30

Flaw # - Type - Remaining:

#364 - LOF - 0.117"D 4"L
#365 - LOF - 0.093"D 5.5"L
#366 - LOF - 0.116"D 3"L
#367-Gouge-BS-0.137"D 0.05"L
#368 - Grout Nozzle - 0.217"R



Drawing is not to scale

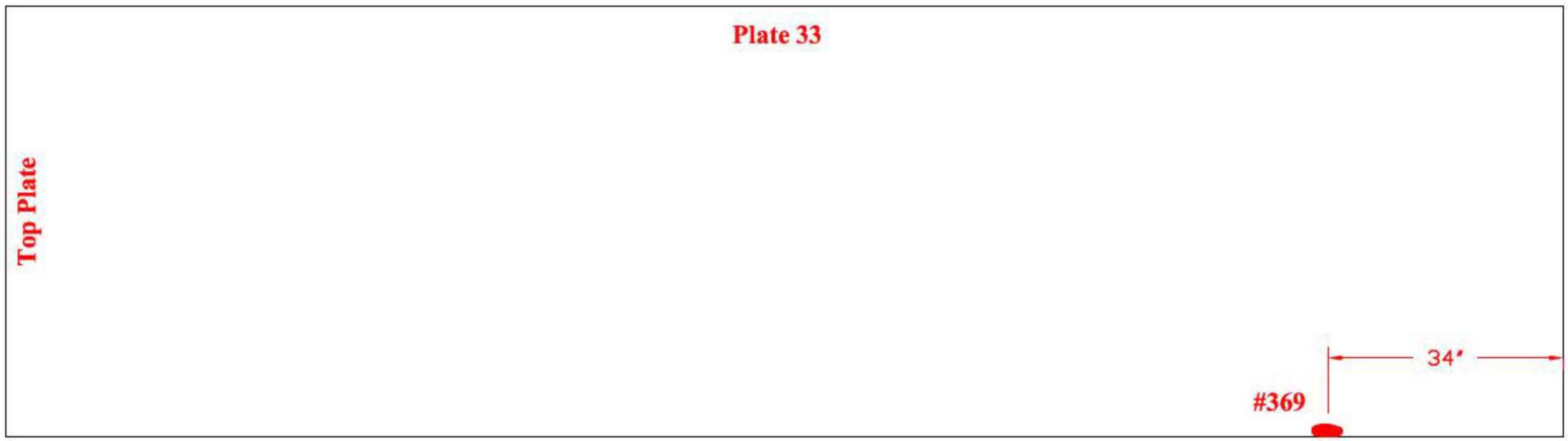
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: A
Plate #:29

Flaw # - Type - Remaining:

#369 - Pit - 0.125" DIA
Limited Scan
(Interference)



Drawing is not to scale

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TANK # 20 - QUADRANT A AND B

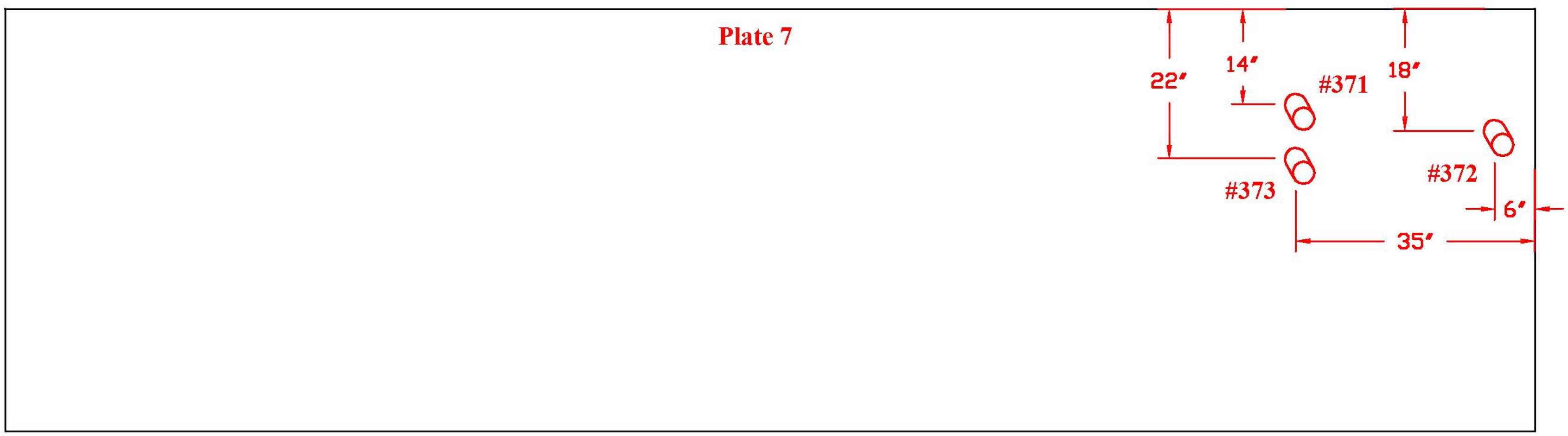
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: A

Course: 2
Plate #:7

Flaw # - Type - Remaining:

#371 - Grout Nozzle - 0.202"R
#372 - Grout Nozzle - 0.194"R
#373 - Grout Nozzle - 0.219"R

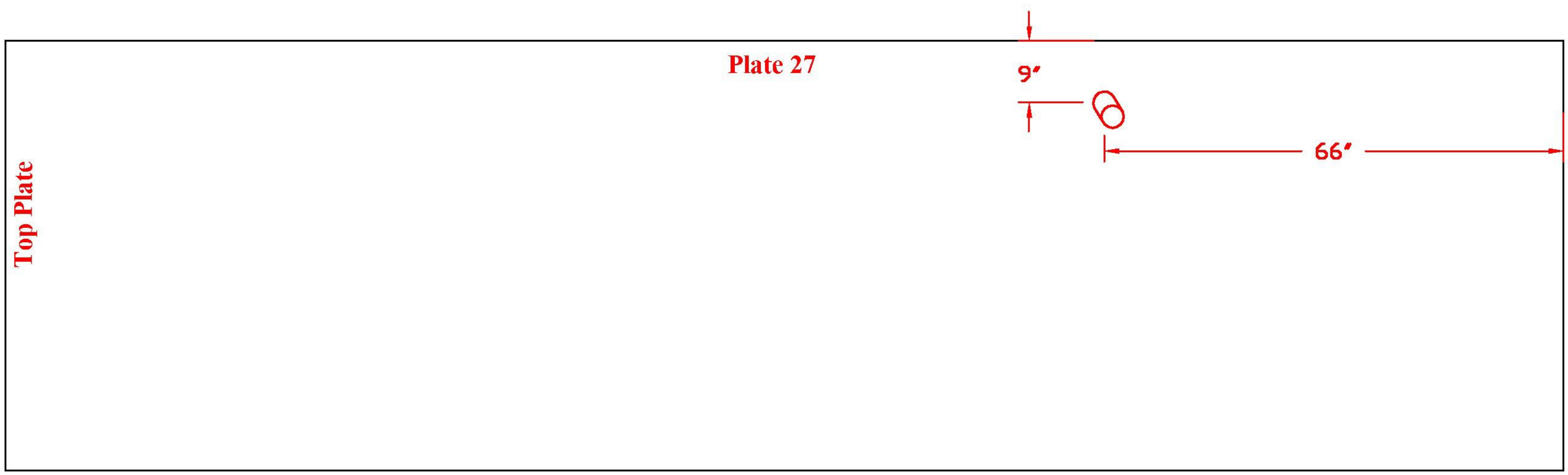


Tank Section: Upper Dome
Quadrant: B

Course: A
Plate #: 27

Flaw # - Type - Remaining:

#374 - Grout Nozzle - 0.214"R



Drawing is not to scale

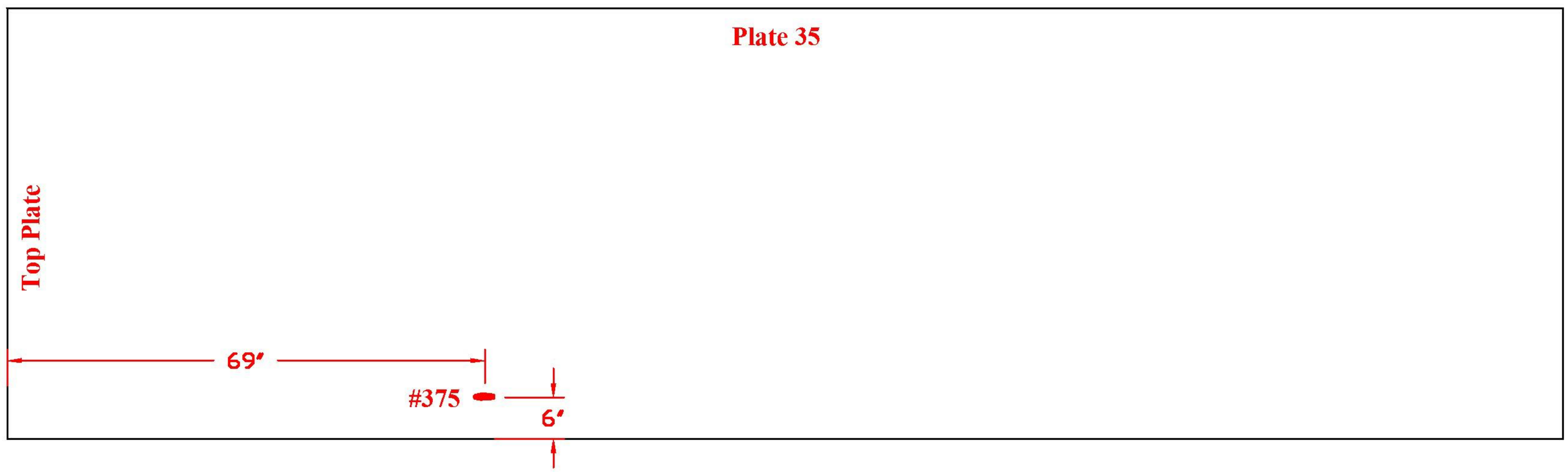
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #:35

Flaw # - Type - Remaining:

#375 - TW - LOF
- 0.143"D 2.5"L

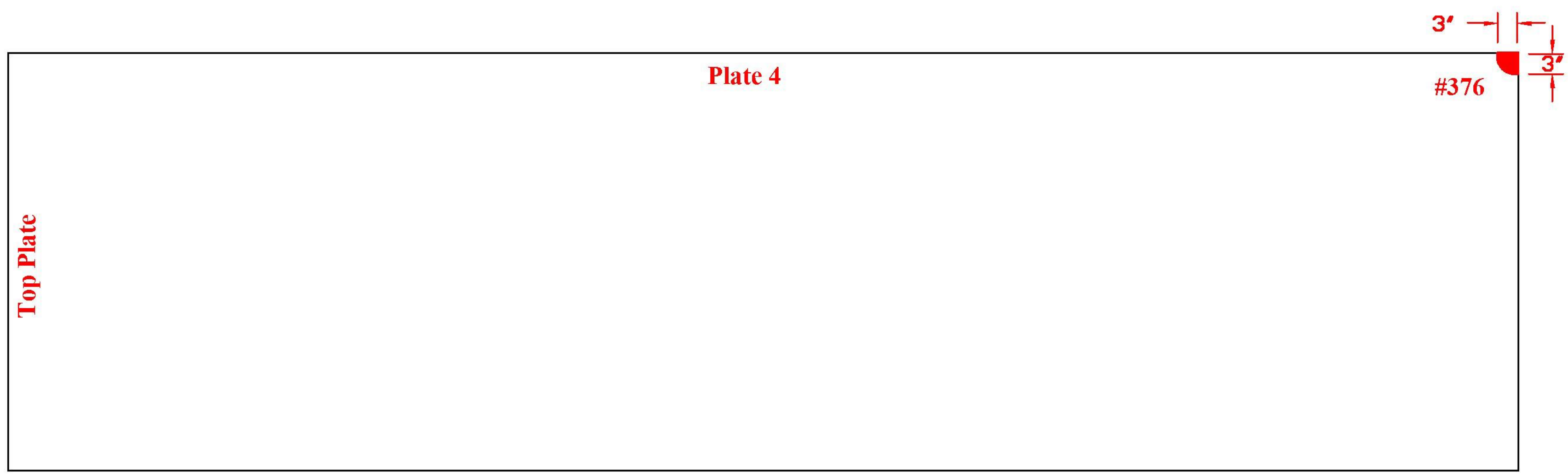


Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 4

Flaw # - Type - Remaining:

#376 - WL - 0.230"R



Drawing is not to scale

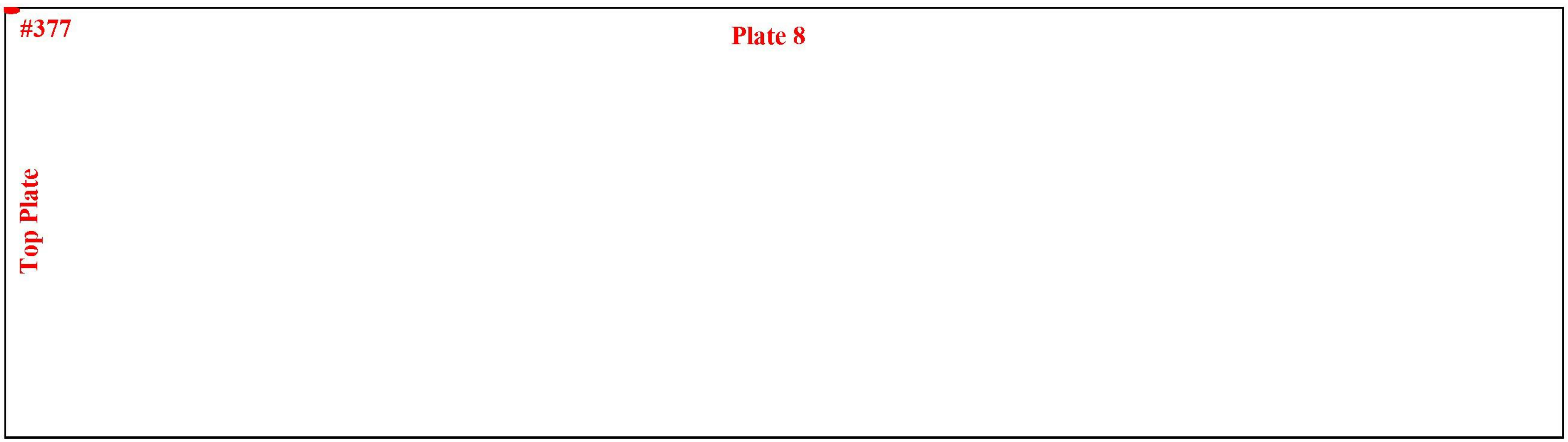
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: B
Plate #: 8

Flaw # - Type - Remaining:

#377 - LOF - 0.053"D 1"L

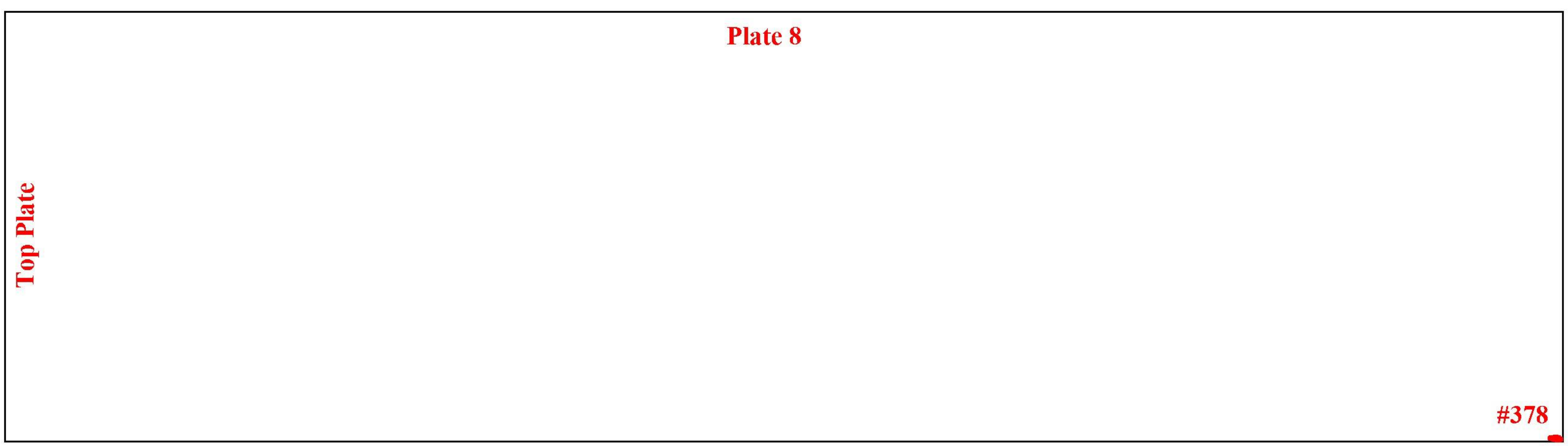


Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 8

Flaw # - Type - Remaining:

#378 - LOF - 0.132"D 1"L



Drawing is not to scale

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TANK # 20 - QUADRANT A

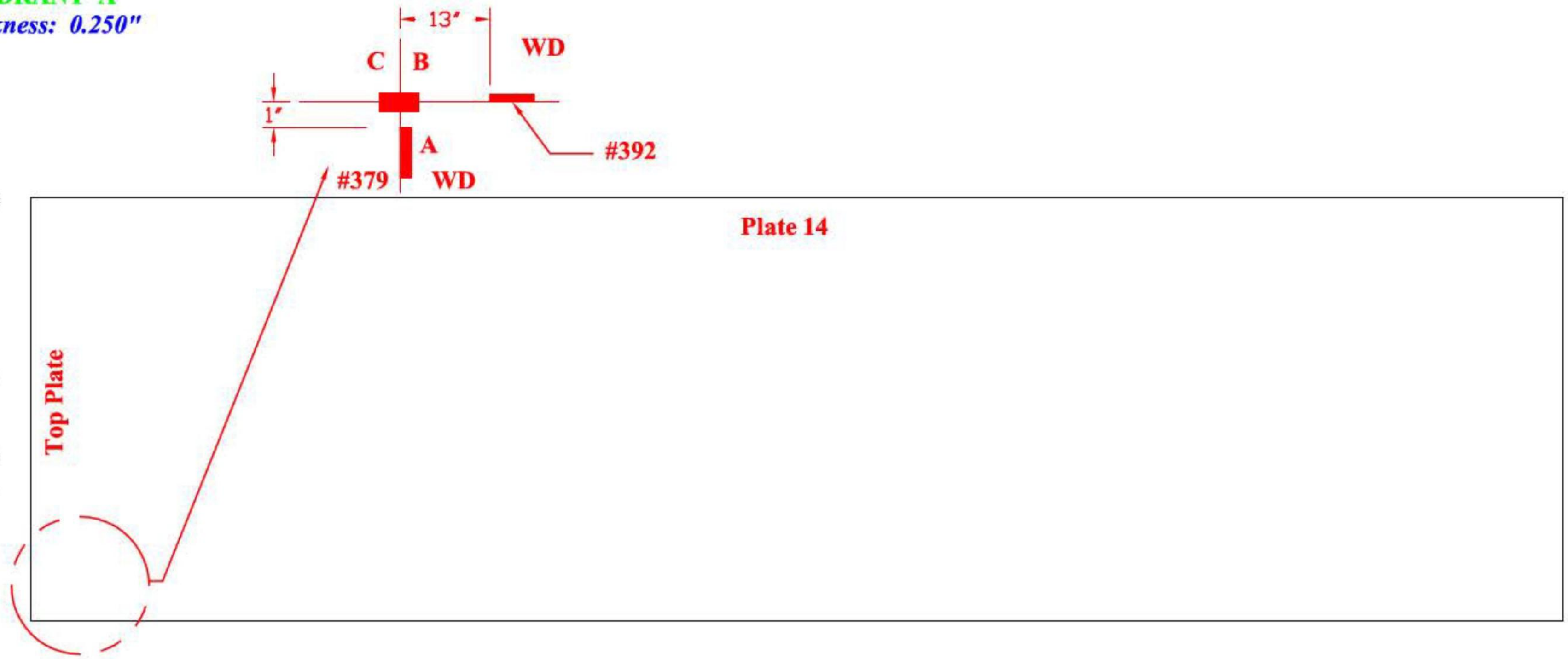
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: B
Plate #: 14

Flaw # - Type - Remaining:

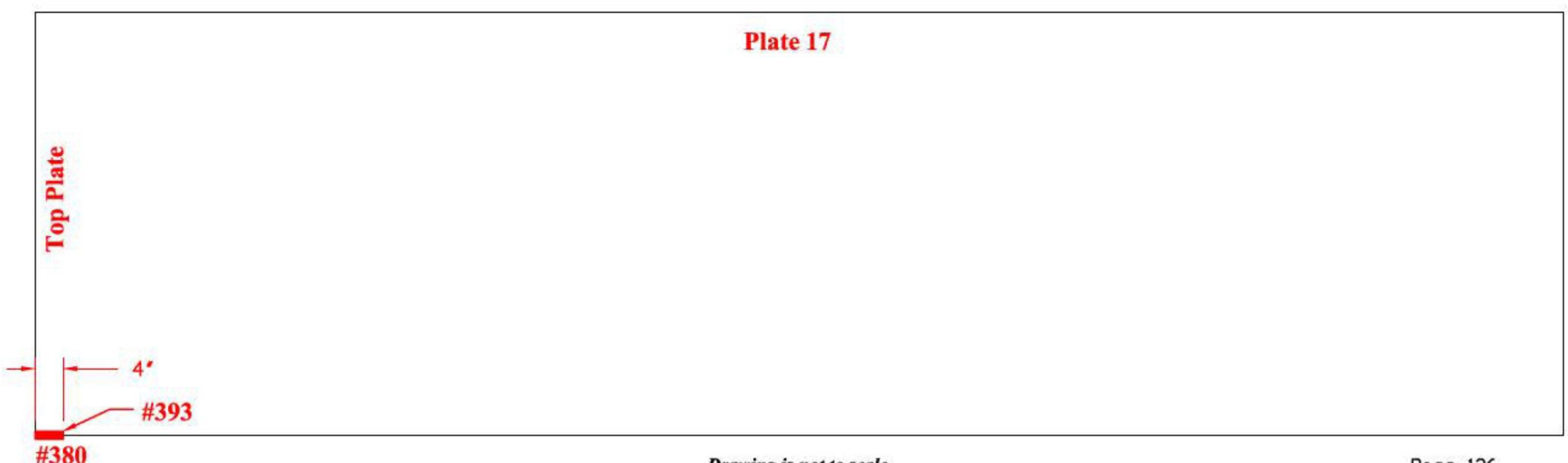
#379:A) LOF-0.156"D 5"L
B) LOF-0.133"D 3"L
C) LOF-0.205"D 3"L
#392: LOF - 0.207"D 4"L



Tank Section:Upper Dome
Quadrant: A

Course: B
Plate #: 17

Flaw # - Type - Remaining:
#380: LOF - 0.109"D 4"L
#393: LOF - 0.207"D 4"L



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

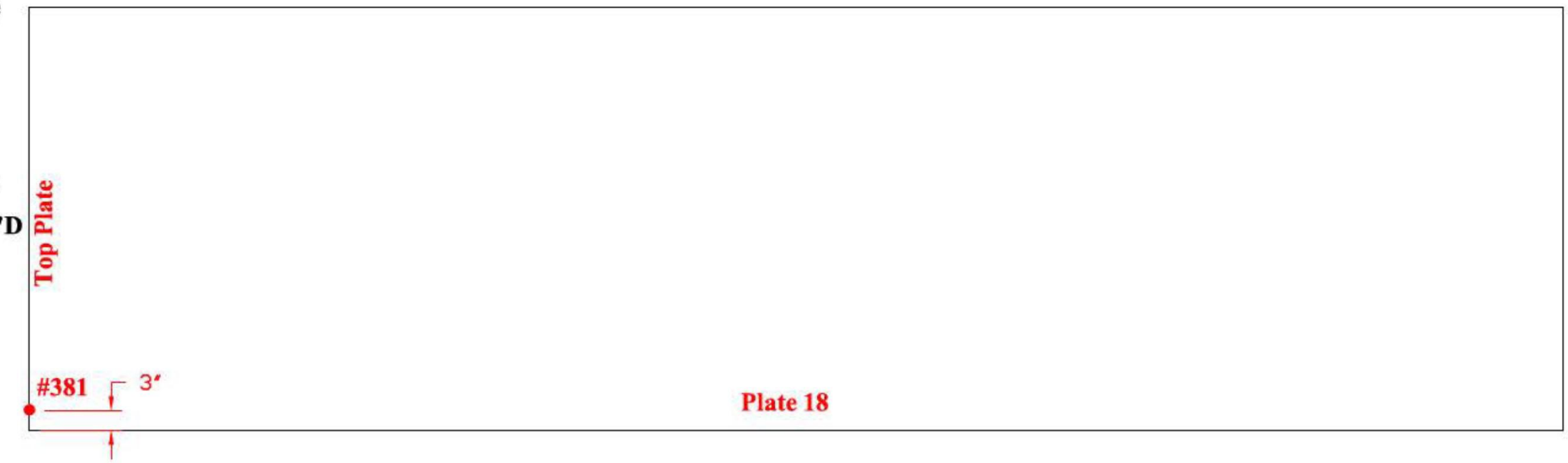
TesTex
WWW.TESTEX-NDT.COM

TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: B
Plate #: 18

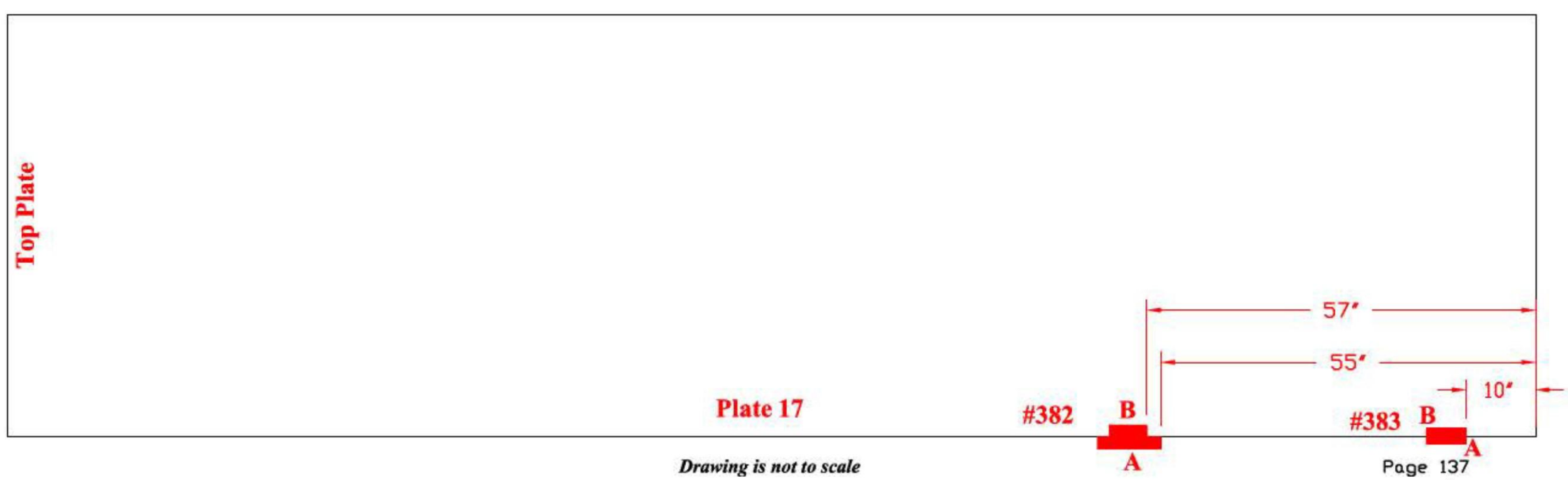
Flaw # - Type - Remaining:
#381-Pit - 0.063"DIA 0.063"D



Tank Section:Upper Dome
Quadrant: B

Course: C
Plate #: 17

Flaw # - Type - Remaining:
#382:A) LOF-0.116"D 7"L
B) LOF-0.073"D 7"L
#383:A) LOF-0.225"D 3"L
B) LOF-0.223"D 3"L



Drawing is not to scale

TANK # 20 - QUADRANT B
***Nominal Plate Thickness: 0.250"**

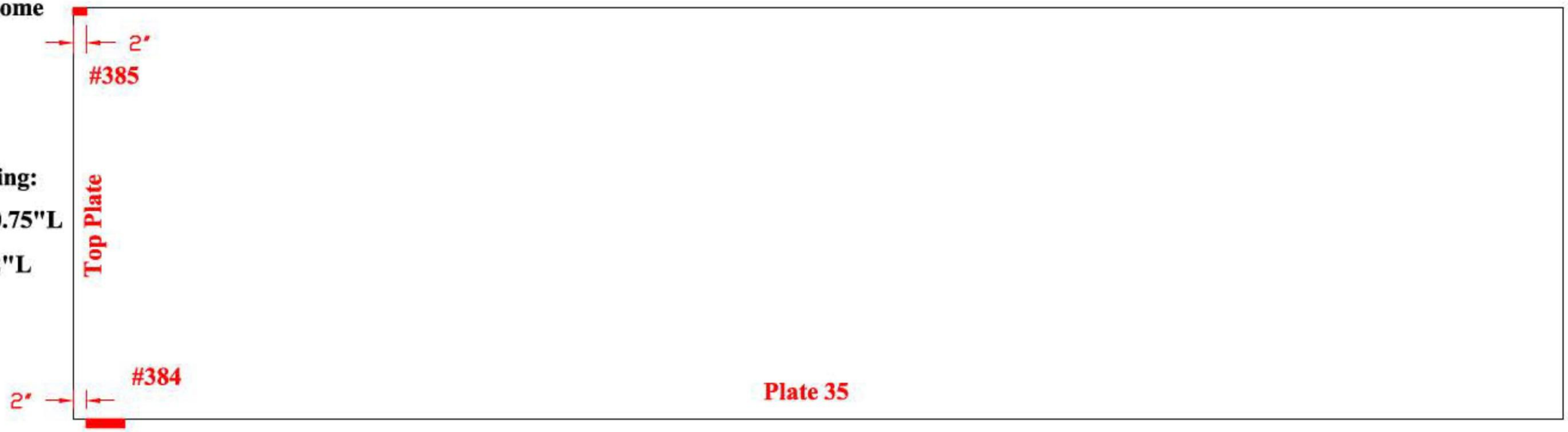
Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #: 35

Flaw # - Type - Remaining:

#384 - LOF - 0.097"D 0.75"L

#385 - LOF - 0.106"D 2"L

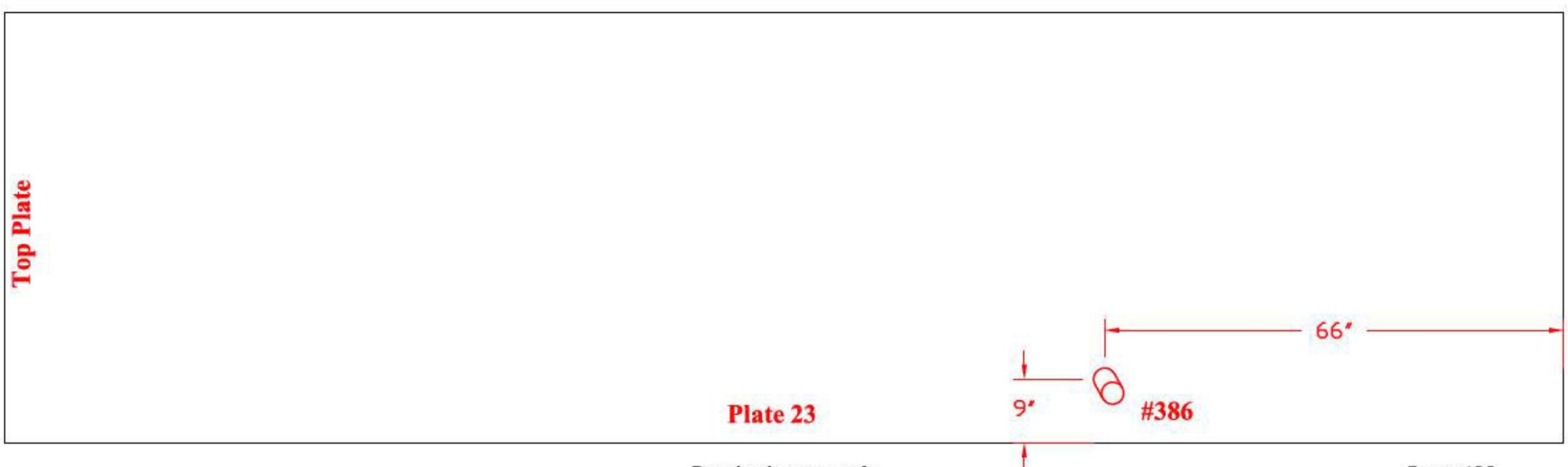


Tank Section:Upper Dome
Quadrant: B

Course: C
Plate #: 23

Flaw # - Type - Remaining:

#386 - Grout Nozzle - 0.180"R



Drawing is not to scale

TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

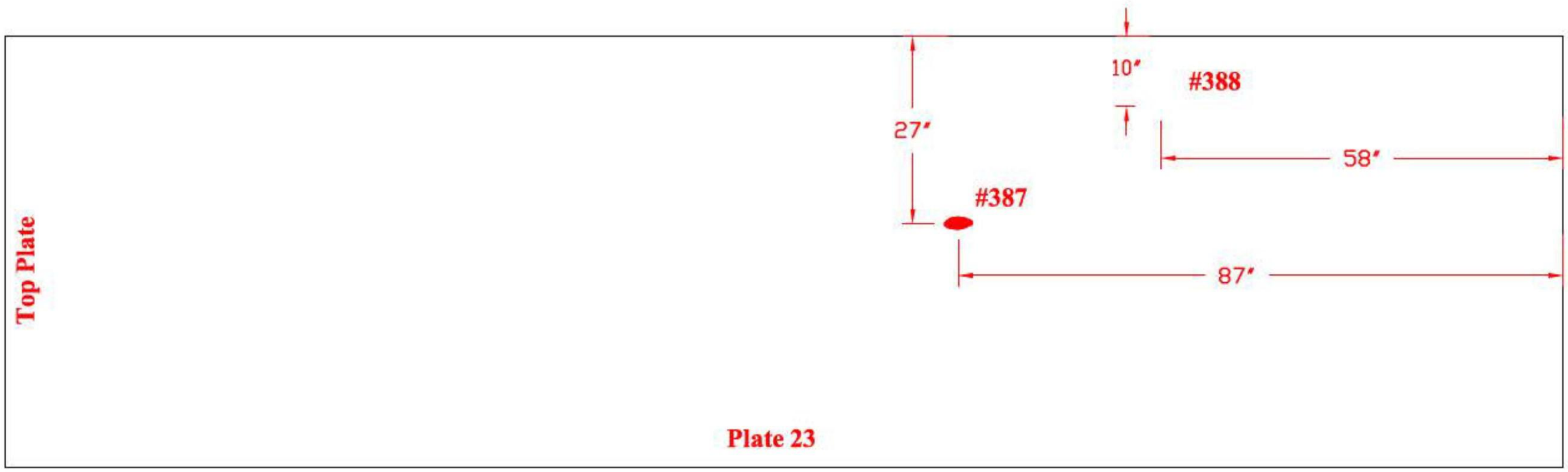
Tank Section: Upper Dome
Quadrant: B

Course: C
Plate #: 23

Flaw # - Type - Remaining:

#387 - Dent - 0.250" deep

#388 - Dent - 0.100" deep

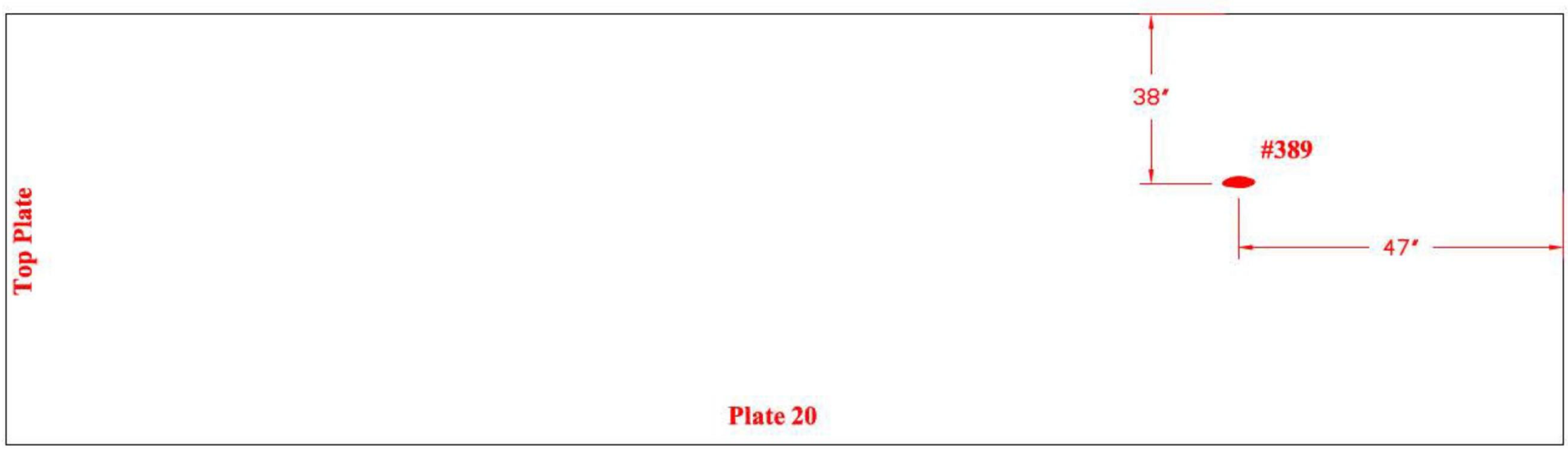


Tank Section:Upper Dome
Quadrant: B

Course: C
Plate #: 20

Flaw # - Type - Remaining:

#389 - Gouge - 0.137"D
1"L 0.500"W



Drawing is not to scale

TANK # 20 - QUADRANT A AND B

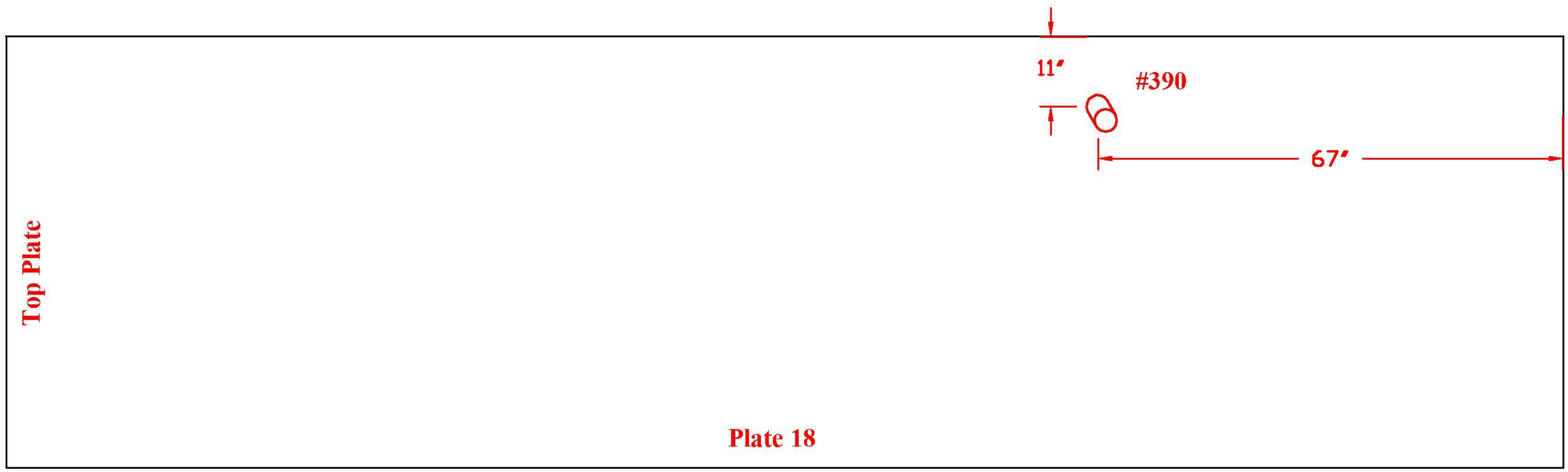
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: C
Plate #: 18

Flaw # - Type - Remaining:

#390 - Grout Nozzle - 0.208"R

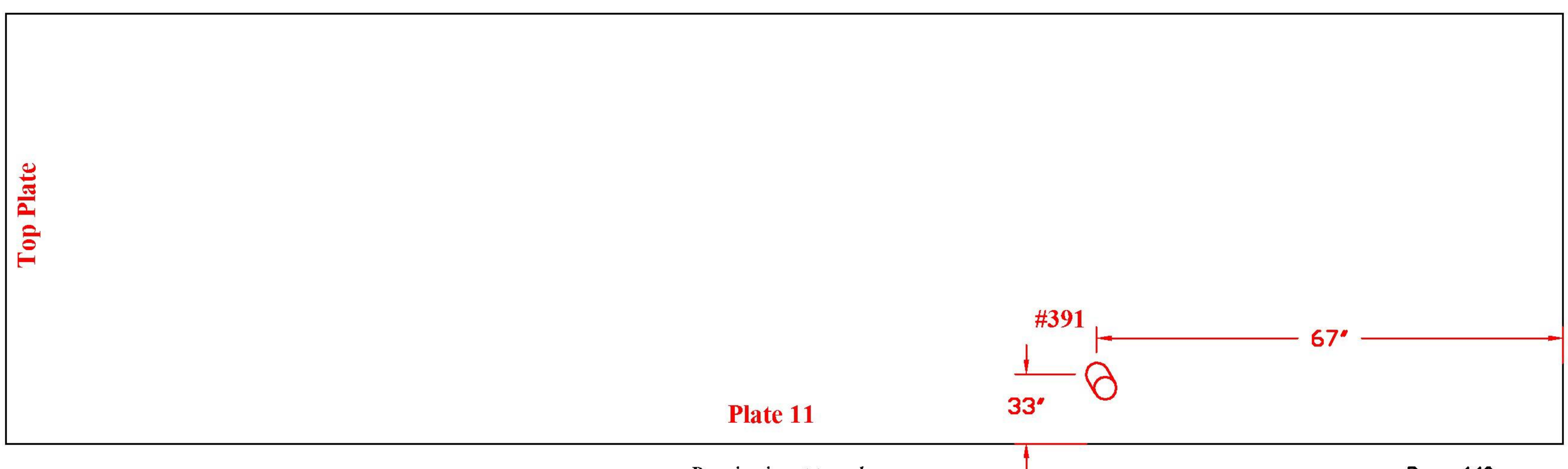


Tank Section:Upper Dome
Quadrant: A

Course: C
Plate #: 11

Flaw # - Type - Remaining:

#391 - Grout Nozzle - 0.220"R



Drawing is not to scale

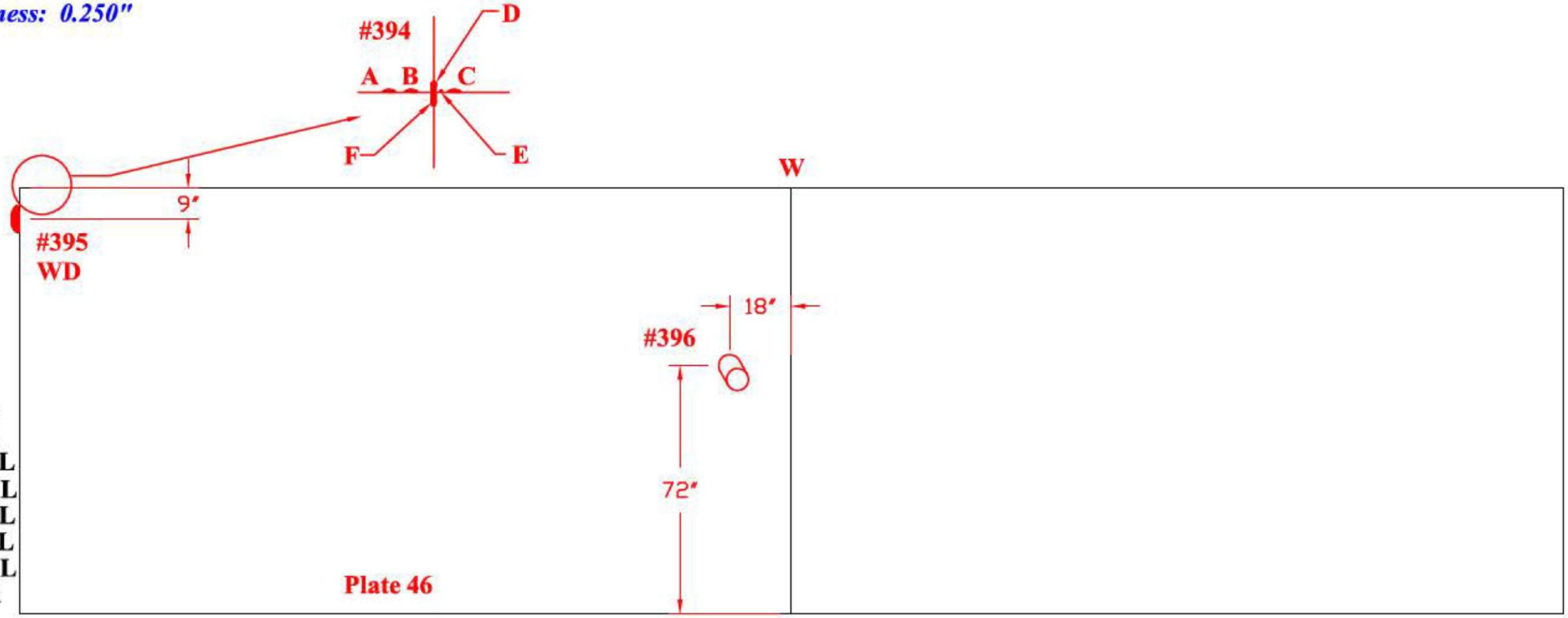
TANK # 20 - QUADRANT D
***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: D

Course: C
Plate #: 46

Flaw # - Type - Remaining:

#394 -A) LOF - 0.087"D 4"L
B) LOF - 0.147"D 3"L
C) LOF - 0.097"D 2.5"L
D) LOF - 0.199"D 2.5"L
E) LOF - 0.125"D.125"L
F) LOF - 0.115"D 4.5"L
#395 - A) LOF - 0.230"D 3.5"L
#396 - Grout Nozzle - 0.212"R

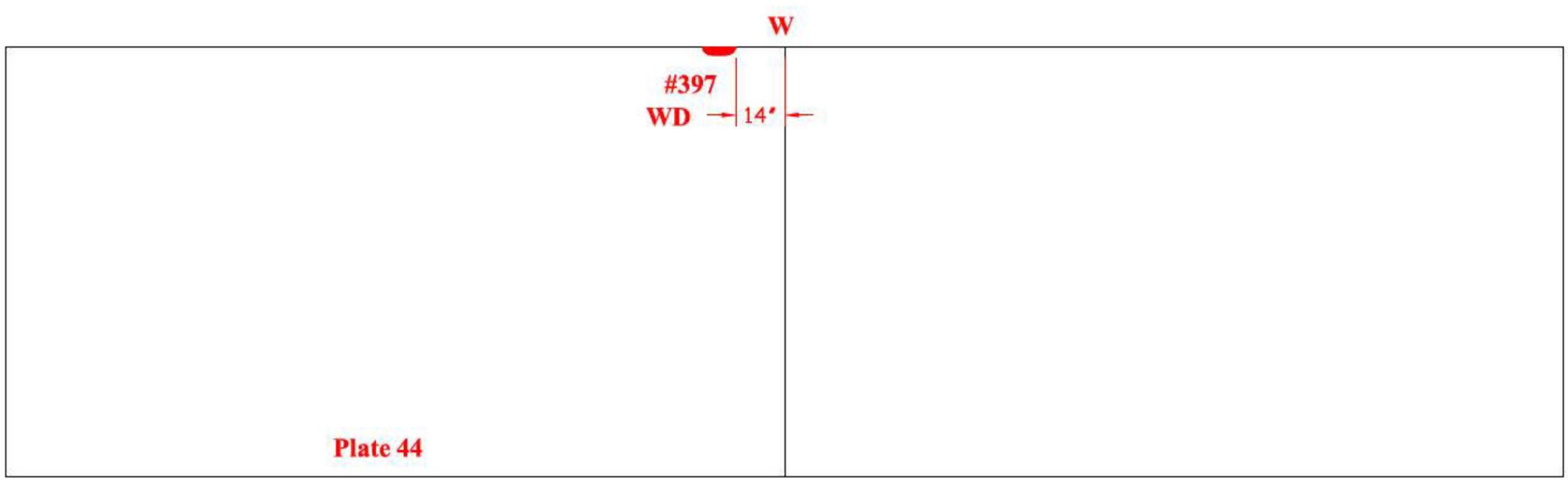


Tank Section:Upper Dome
Quadrant: D

Course: C
Plate #: 44

Flaw # - Type - Remaining:

#397 - LOF - 0.091"D 3"L
Pit - 0.125" DIA



Drawing is not to scale

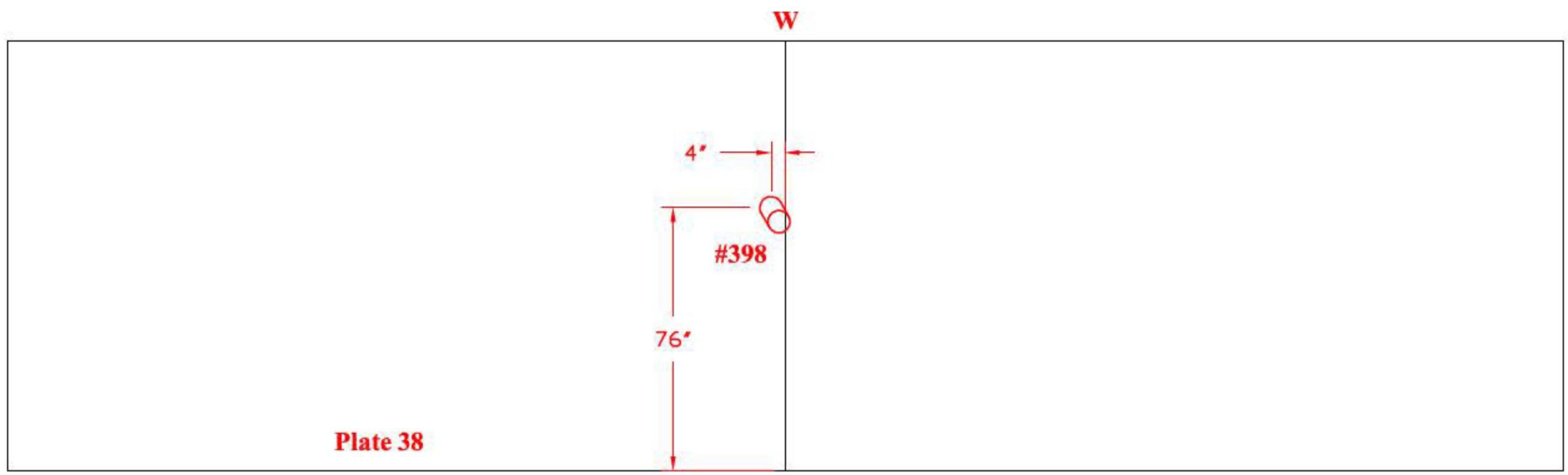
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: C
Plate #: 38

Flaw # - Type - Remaining:

#398 - Grout Nozzle - 0.220"R

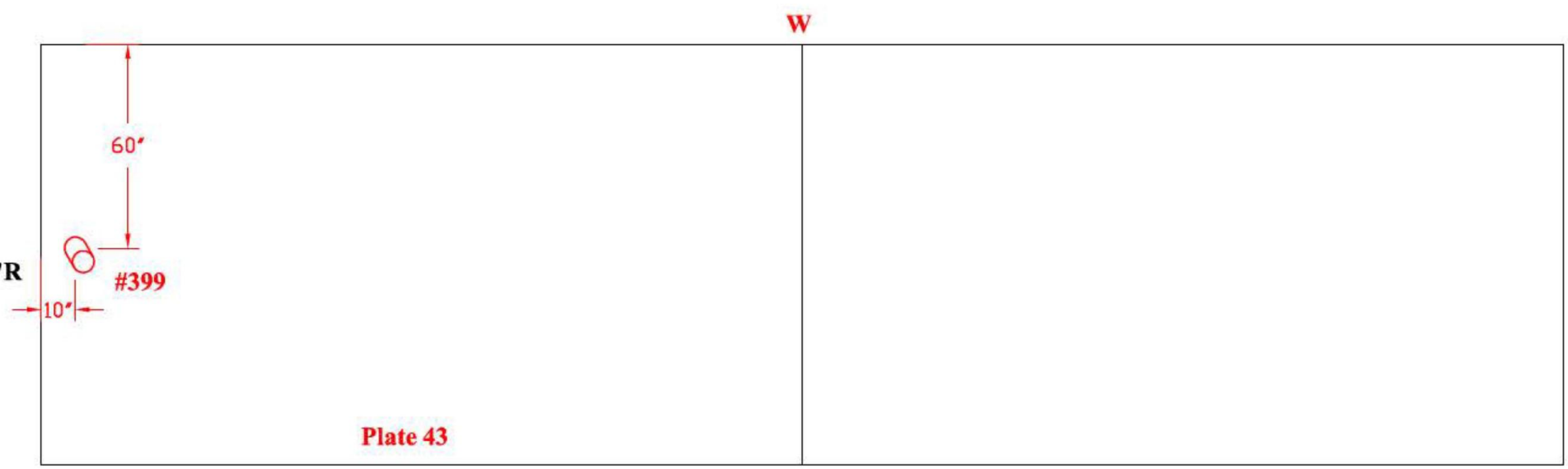


Tank Section:Upper Dome
Quadrant: D

Course: C
Plate #: 43

Flaw # - Type - Remaining:

#399 - Grout Nozzle - 0.220"R



Drawing is not to scale

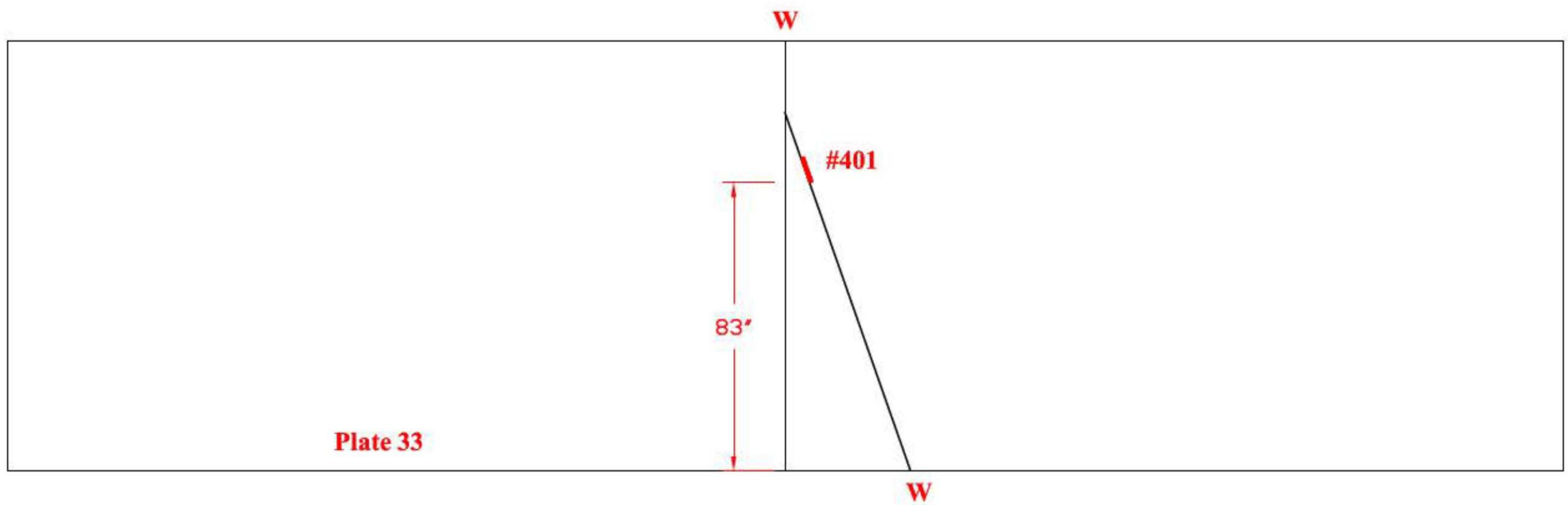
TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: C
Plate #: 33

Flaw # - Type - Remaining:

#401 - LOF - 0.200"D 4.5"L

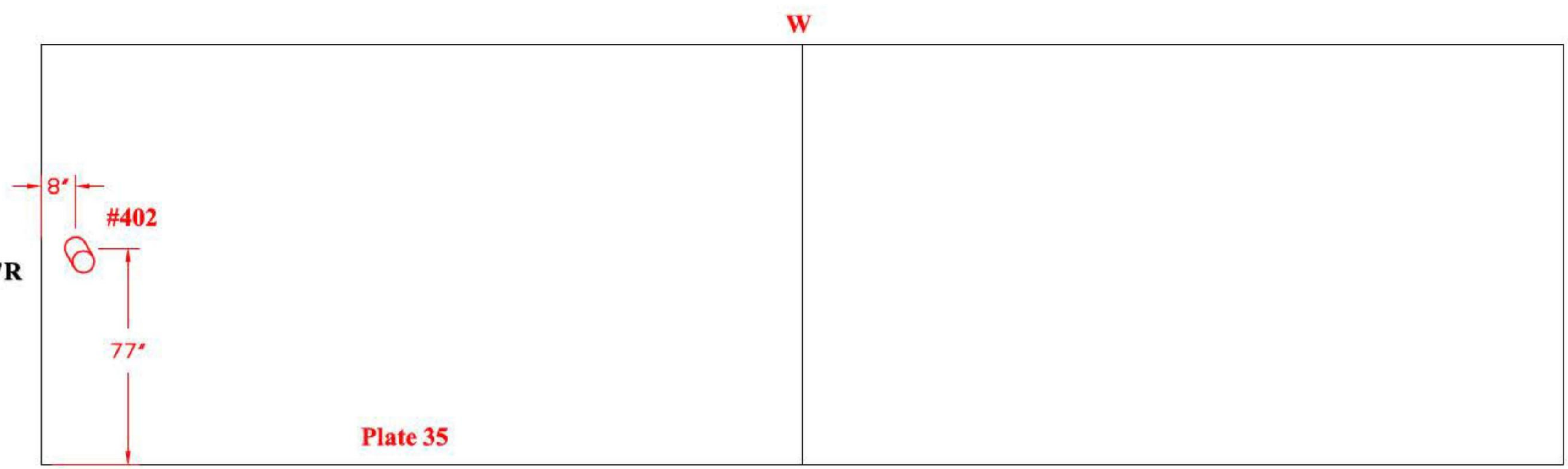


Tank Section:Upper Dome
Quadrant: D

Course: C
Plate #: 35

Flaw # - Type - Remaining:

#402 - Grout Nozzle - 0.229"R



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

TANK # 20 - QUADRANT C
***Nominal Plate Thickness: 0.250"**

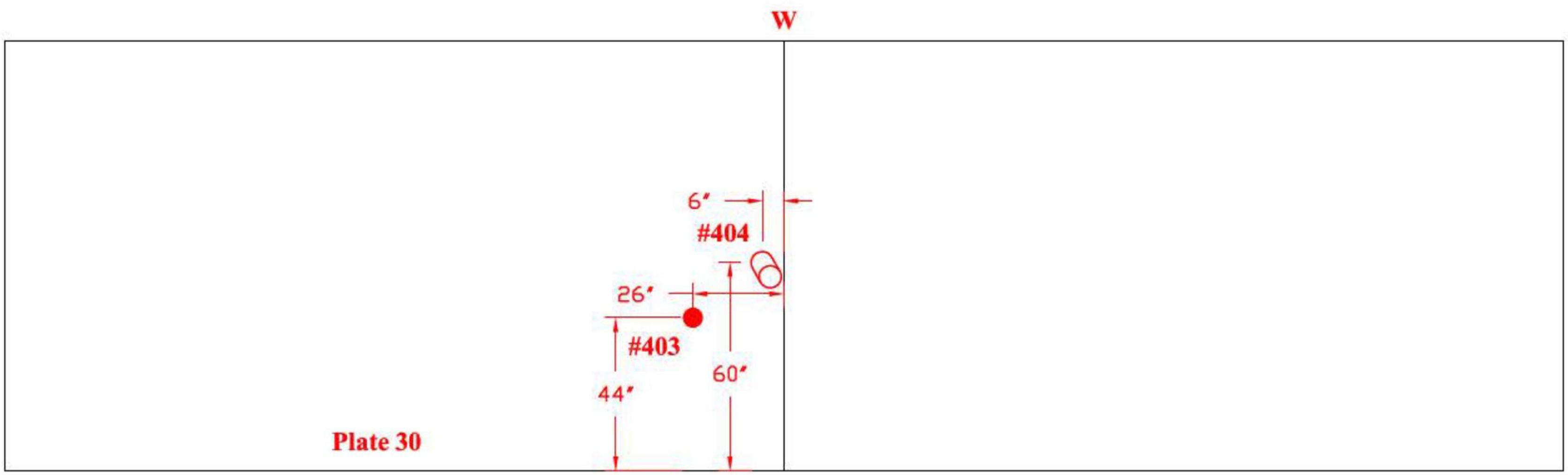
Tank Section: Upper Dome
Quadrant: C

Course: C
Plate #: 30

Flaw # - Type - Remaining:

#403 - Dent - 0.180" deep

#404 - Grout Nozzle - 0.218"R

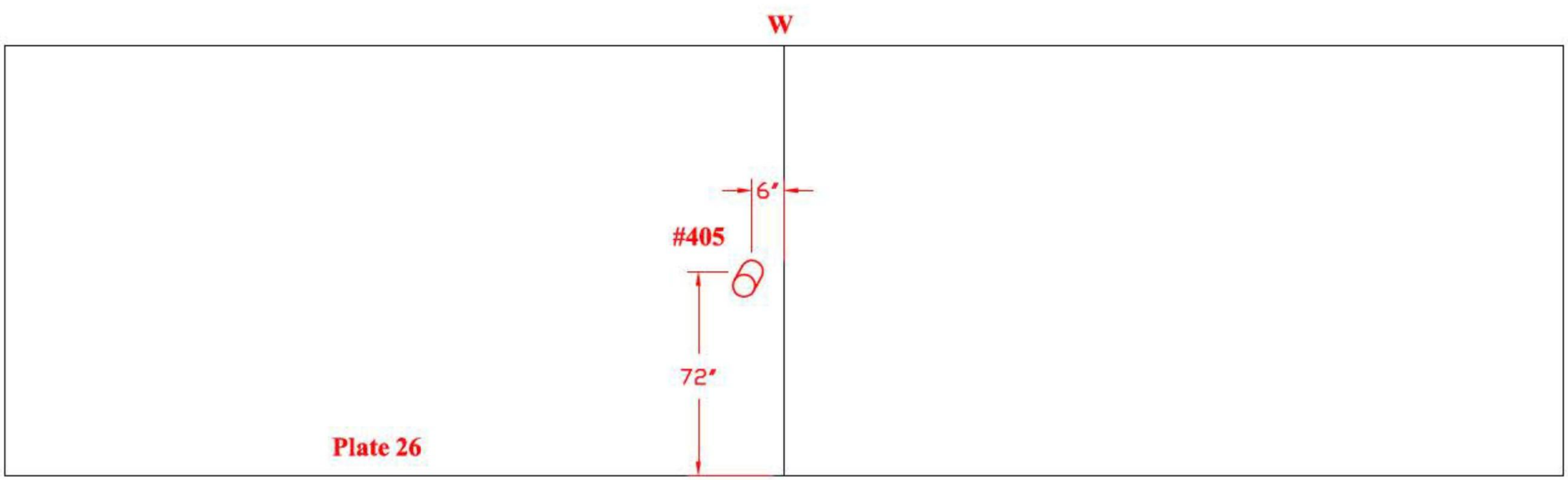


Tank Section:Upper Dome
Quadrant: C

Course: C
Plate #: 26

Flaw # - Type - Remaining:

#405 - Grout Nozzle - 0.218"R



Drawing is not to scale

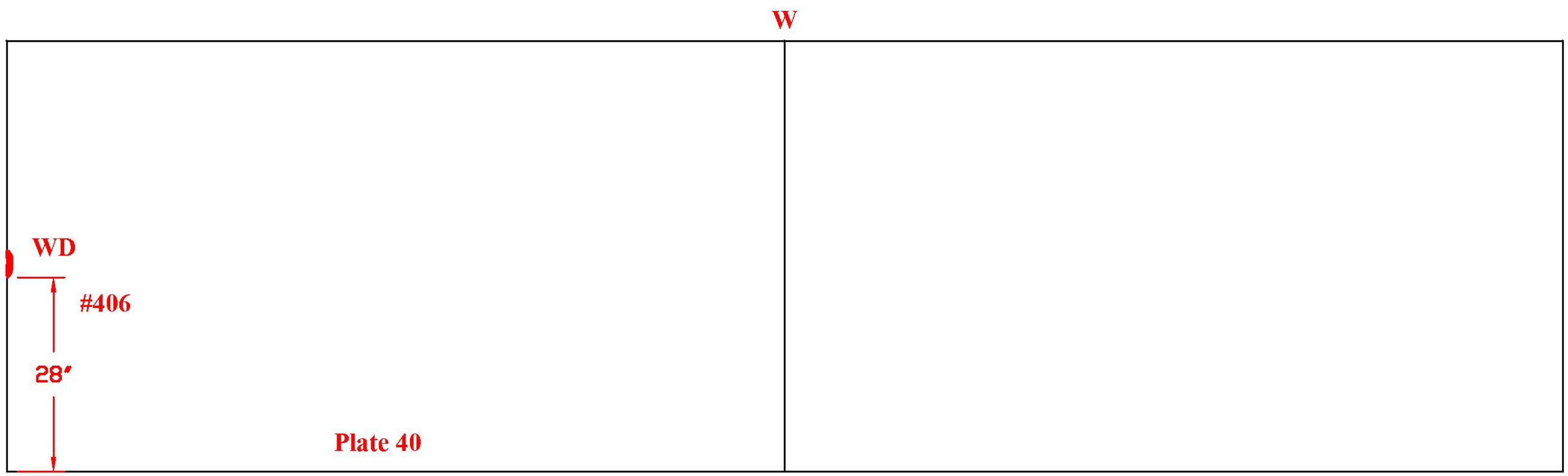
TANK # 20 - QUADRANT C
**Nominal Plate Thickness: 0.250"*

Tank Section: Upper Dome
Quadrant: C

Course: C
Plate #: 40

Flaw # - Type - Remaining:

#406 - LOF - 0.060"D 1"L
Pit - 0.063" DIA

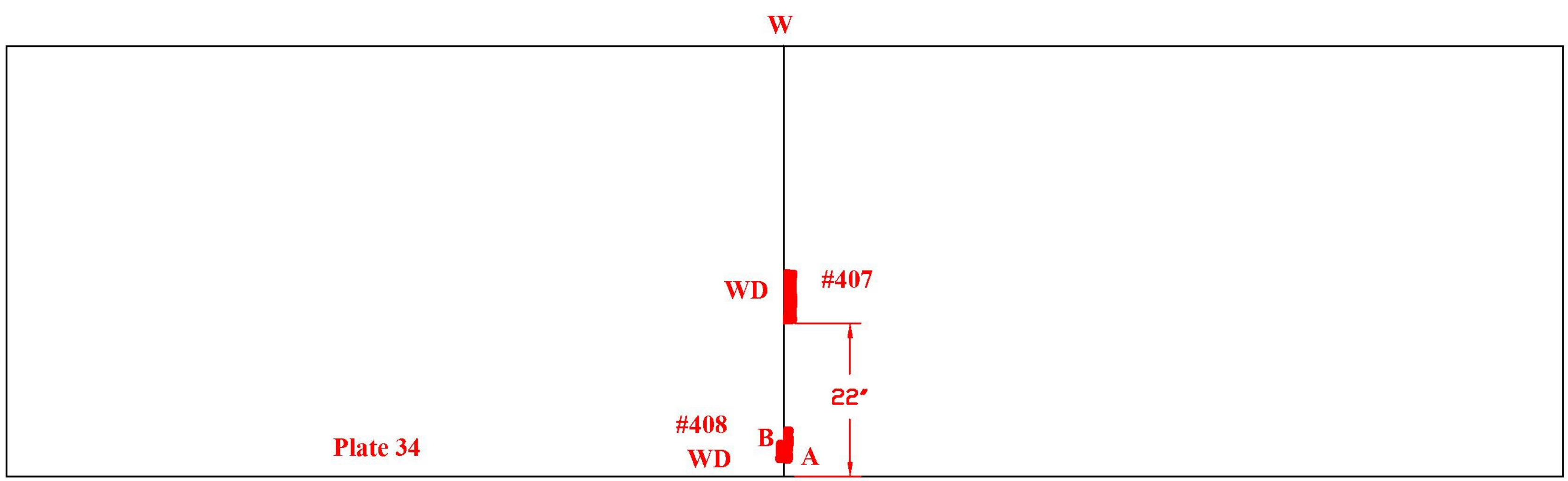


Tank Section:Upper Dome
Quadrant: C

Course: C
Plate #: 34

Flaw # - Type - Remaining:

#407 - LOF - 0.100"D 5"L
#408: A) LOF - 0.131"D 2"L
B) LOF - 0.111"D 1.5"L



Drawing is not to scale

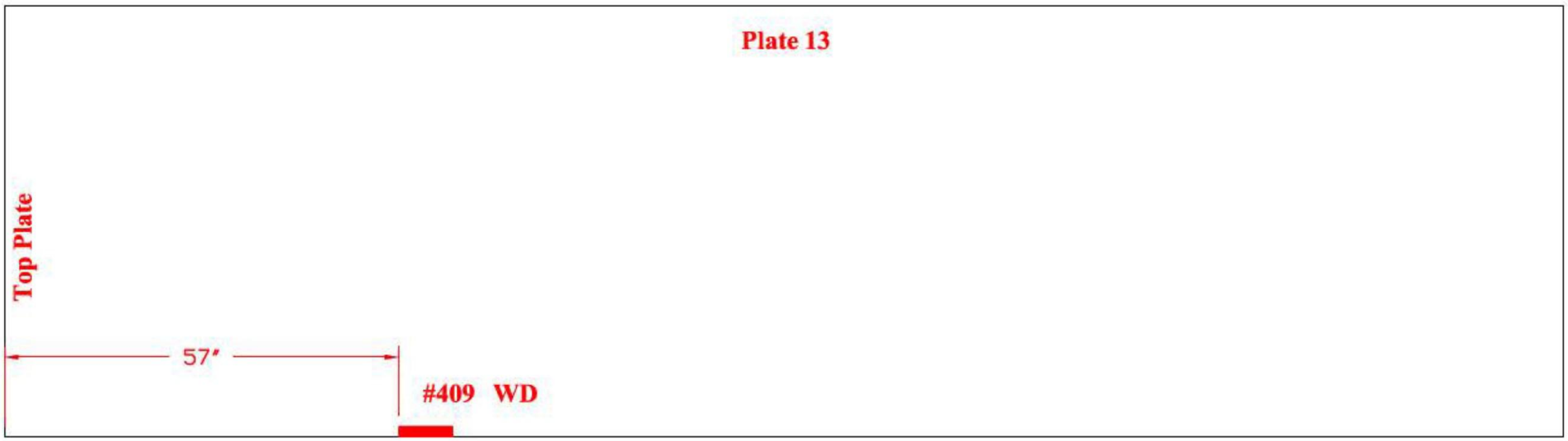
TANK # 20 - QUADRANT A AND B
***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 13

Flaw # - Type - Remaining:

#409 - LOF - 0.089"D 4"L

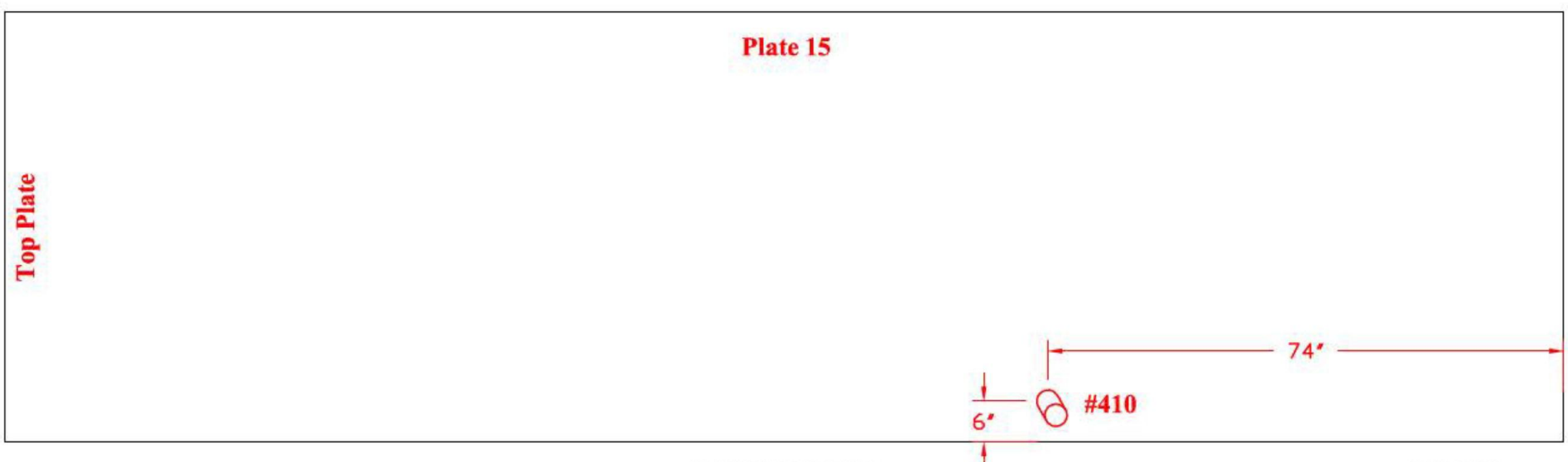


Tank Section:Upper Dome
Quadrant: B

Course: C
Plate #: 15

Flaw # - Type - Remaining:

#410 - Grout Nozzle - 0.190"R



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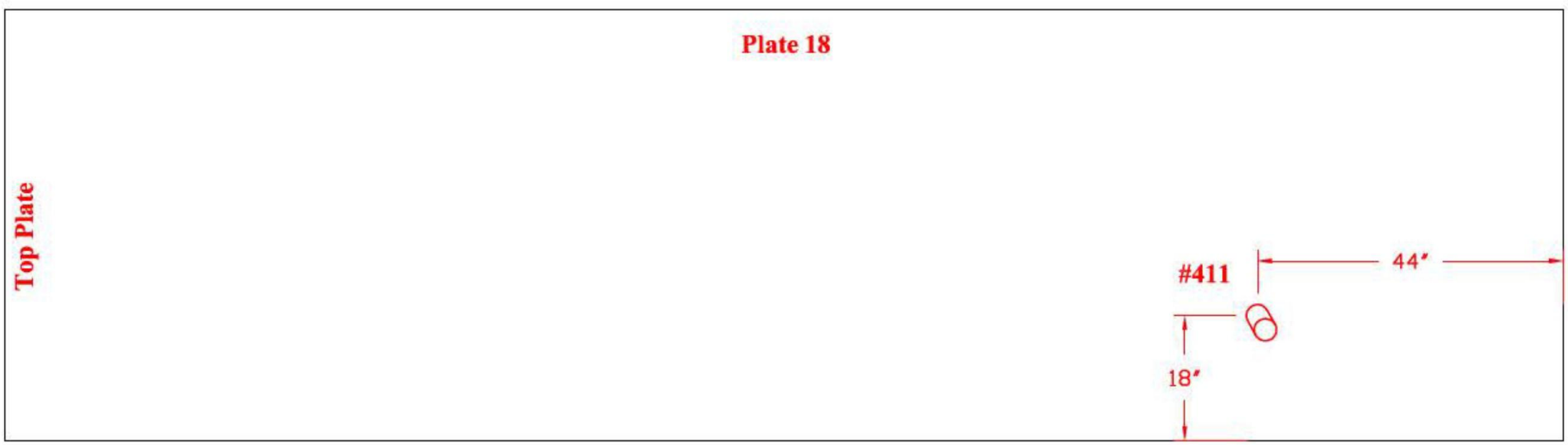
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A
Course: B
Plate #: 18

Flaw # - Type - Remaining:

#411 - Grout Nozzle - 0.210"R

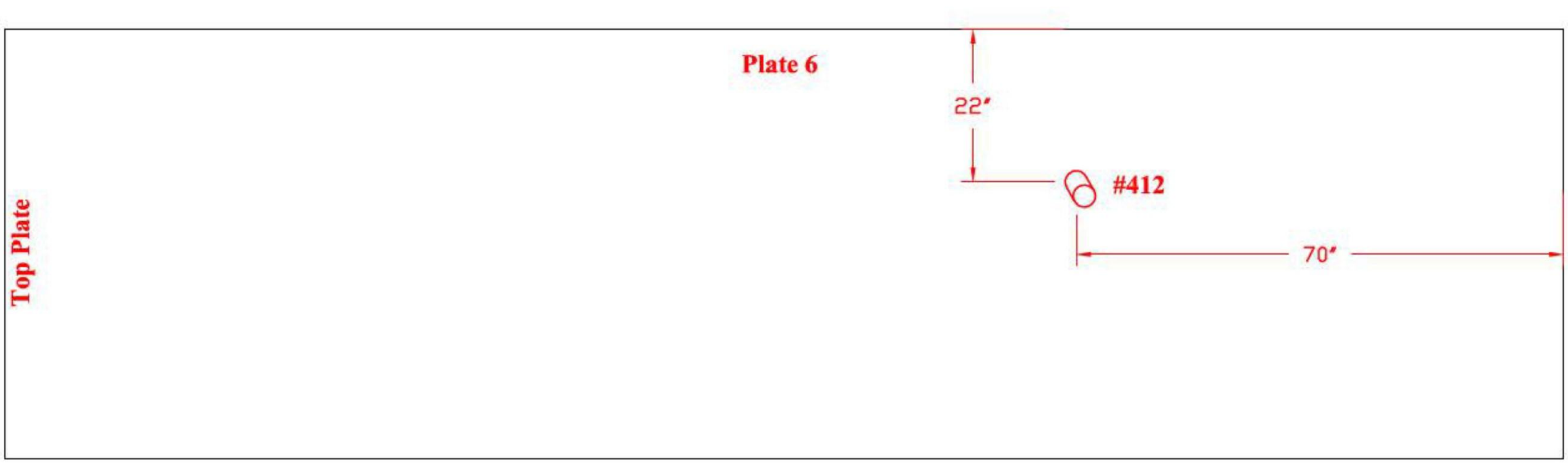


Tank Section:Upper Dome
Quadrant: A

Course: C
Plate #: 6

Flaw # - Type - Remaining:

#412 - Grout Nozzle - 0.225"R



Drawing is not to scale

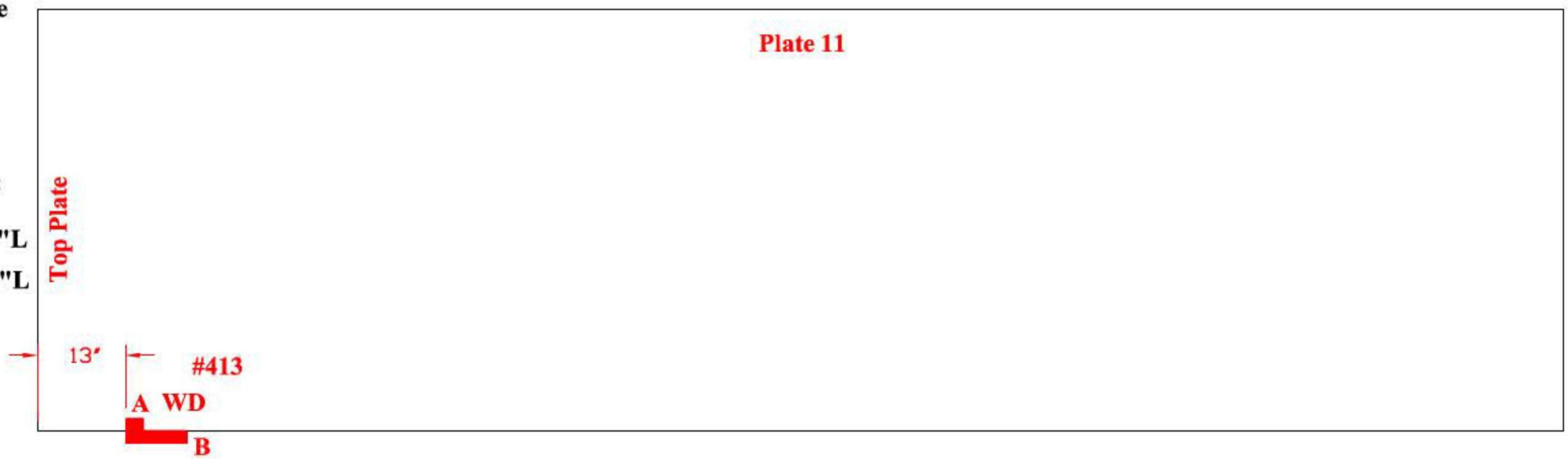
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 11

Flaw # - Type - Remaining:

#413: A) - LOF - 0.229"D 1"L
B) - LOF - 0.149"D 5"L

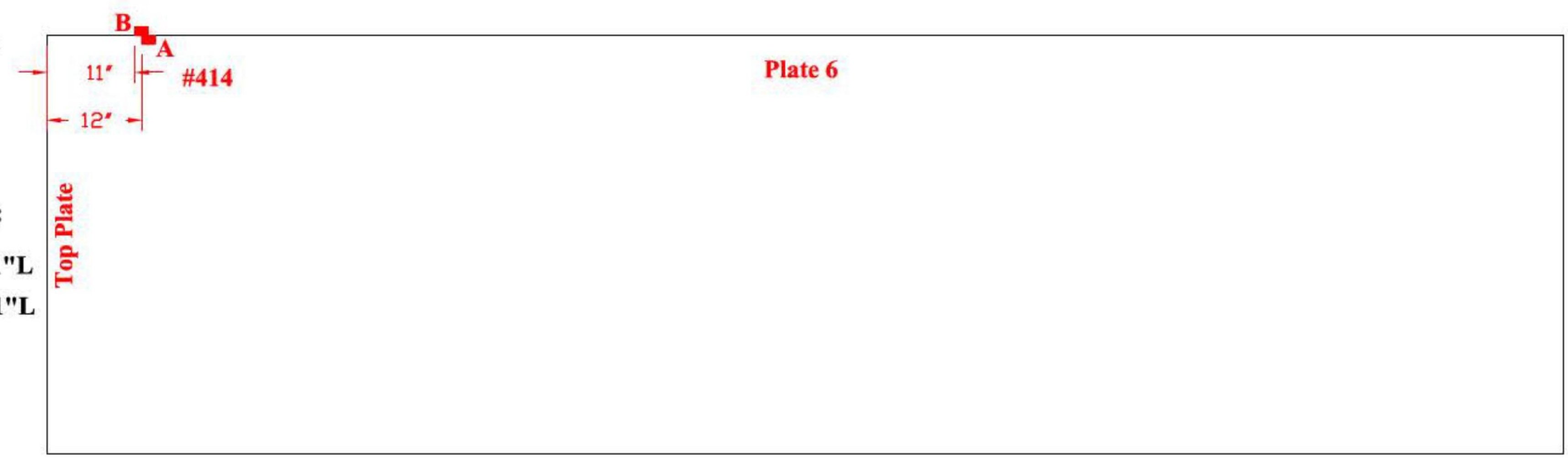


Tank Section:Upper Dome
Quadrant: A

Course: C
Plate #: 6

Flaw # - Type - Remaining:

#414: A) - LOF - 0.212"D 1"L
B) - LOF - 0.229"D 1"L



Drawing is not to scale

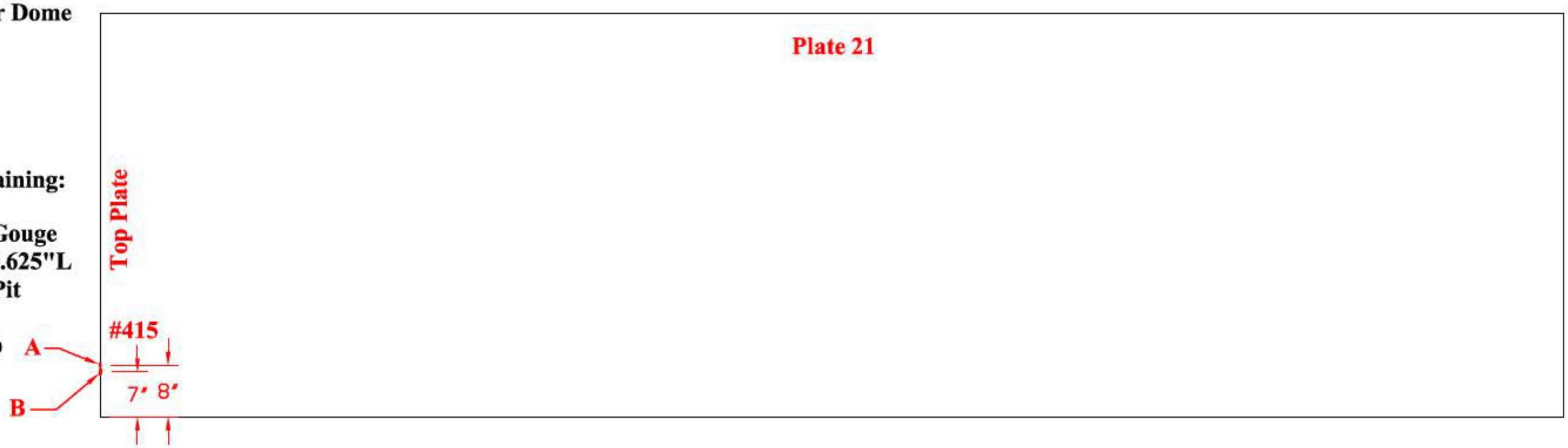
TANK # 20 - QUADRANT B AND C
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: C
Plate #: 21

Flaw # - Type - Remaining:

#415: A) - BS - BM - Gouge
- 0.132"D 0.625"L
B) - BS - BM - Pit
- 0.125"DIA
0.107" deep

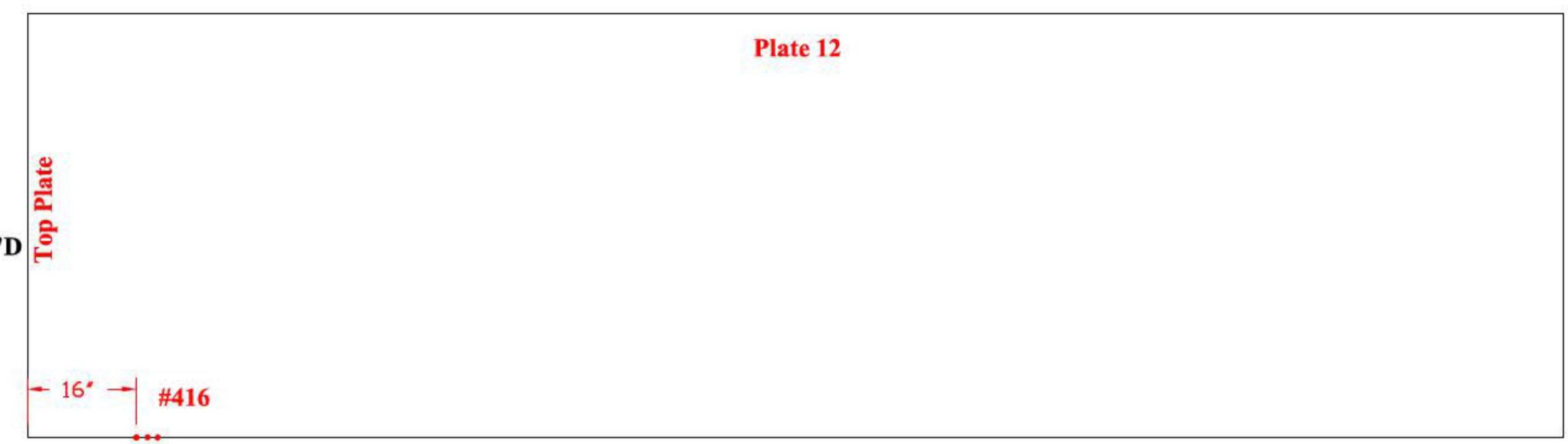


Tank Section:Upper Dome
Quadrant: C

Course: C
Plate #: 12

Flaw # - Type - Remaining:

#416 -WP- 0.125"DIA 0.089"D



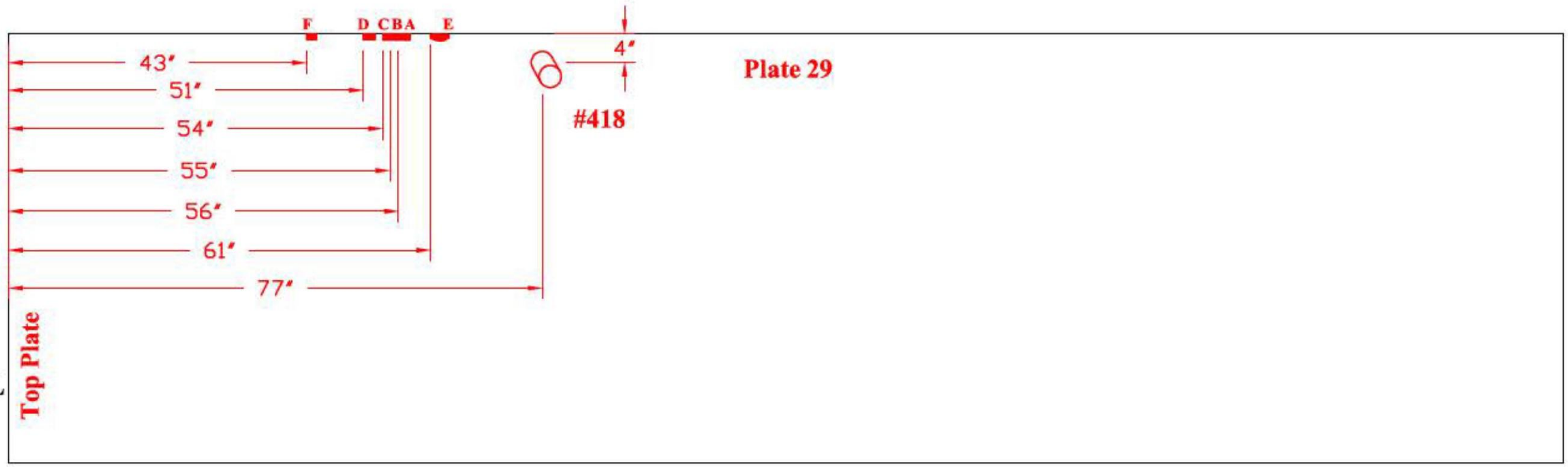
Drawing is not to scale

TANK # 20 - QUADRANT A AND C

Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: C
Plate #: 29
Flaw # - Type - Remaining:
#417:
A)BM-LOF-TW-0.091"D 2"L
B)BM-Gouge-0.115"D 1"L
C)BM-LOF-TW-0.047"D 1"L
D)BM-LOF-TW-0.106"D 2"L
E)BM-LOF-TW-0.054"D 3"L
B)BM - Gouge - 0.160"D 1.5"L 0.500W
#418 - Grout Nozzle - 0.236"R

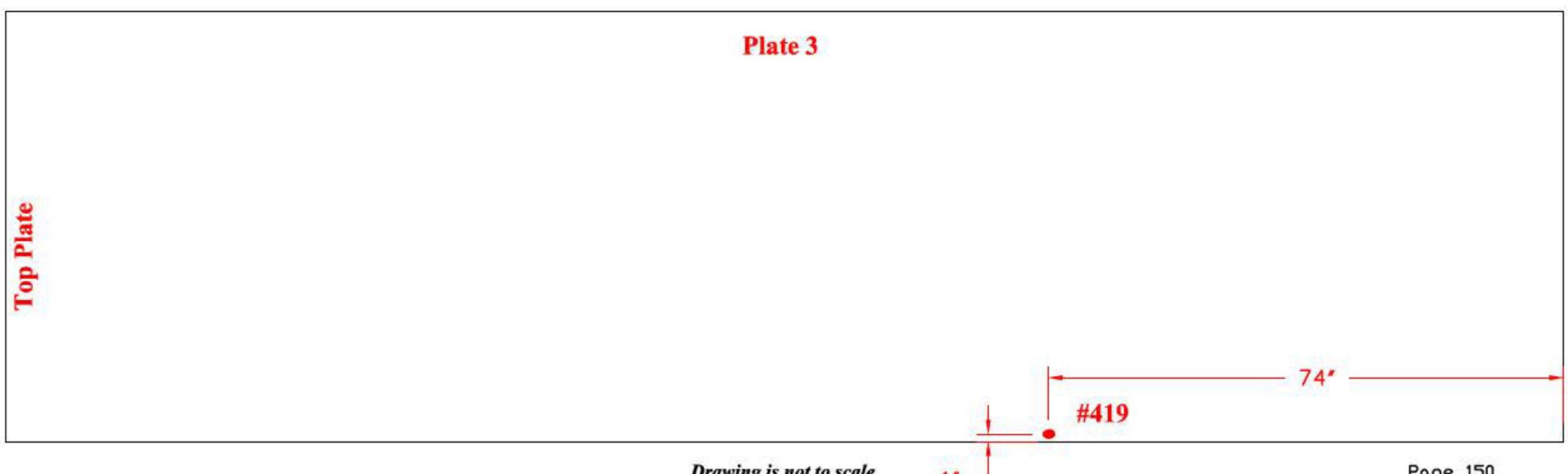


Tank Section:Upper Dome
Quadrant: A

Course: B
Plate #: 3

Flaw # - Type - Remaining:

#419 - Dent - 0.200" deep



Drawing is not to scale

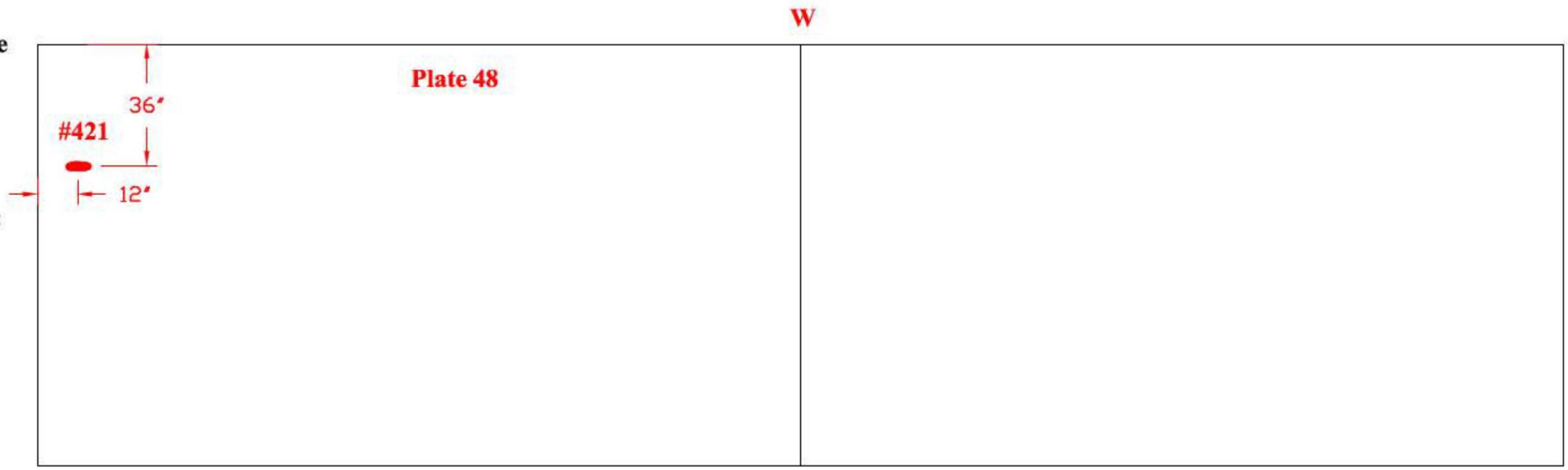
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: D
Plate #: 48

Flaw # - Type - Remaining:

#421 - TW - LOF
- 0.082"D 1.5" dia

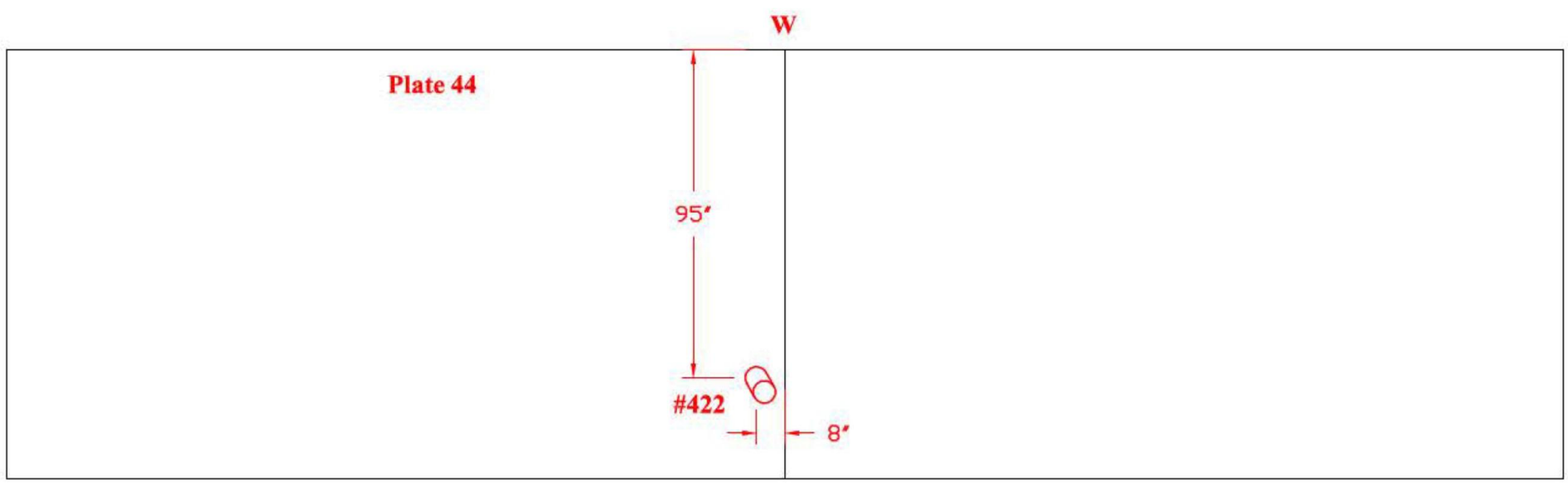


Tank Section:Upper Dome
Quadrant: D

Course: D
Plate #: 44

Flaw # - Type - Remaining:

#422 - Grout Nozzle - 0.200"R



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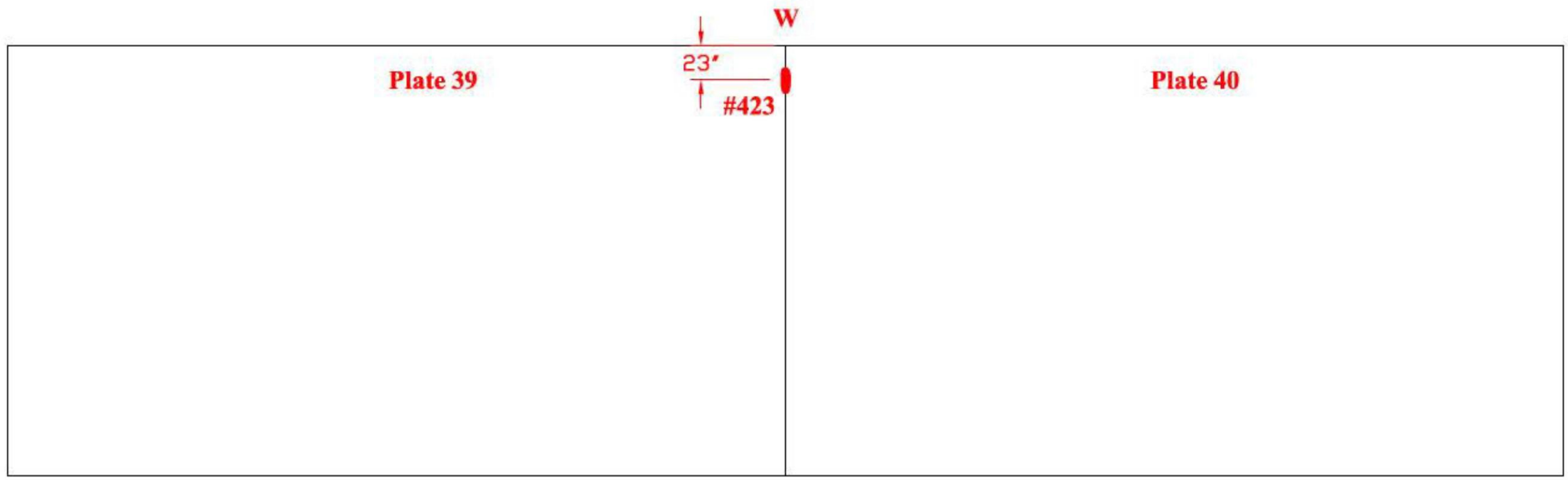
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: D
Plate #: 39

Flaw # - Type - Remaining:

#423 - LOF - 0.106"D 9"L
- LOF - 0.218"D 11"L

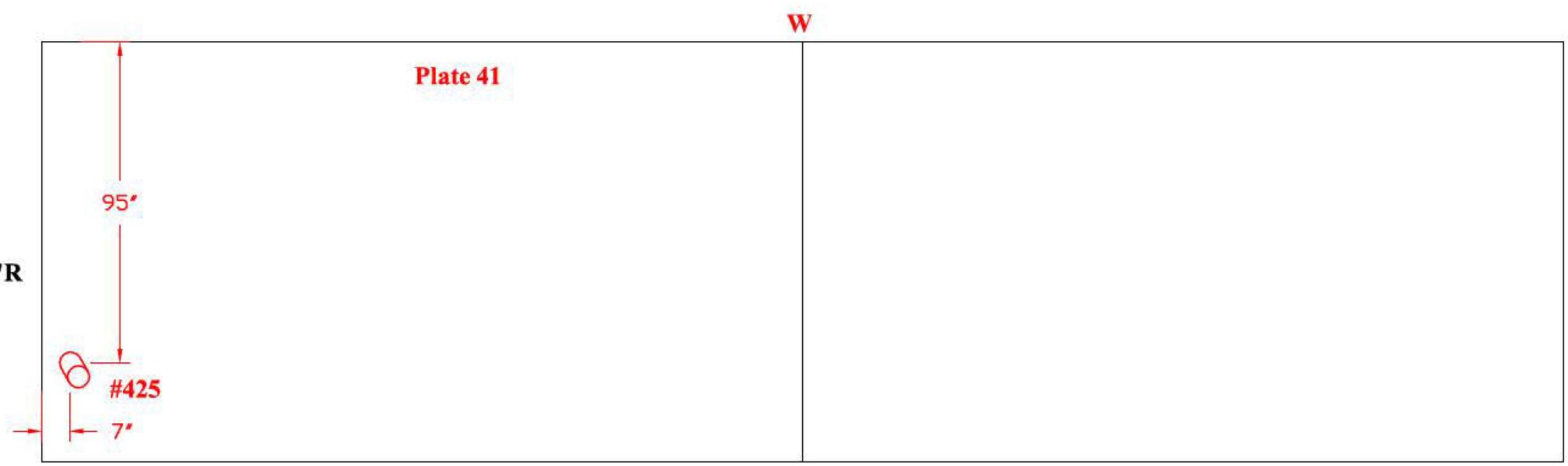


Tank Section:Upper Dome
Quadrant: D

Course: D
Plate #: 41

Flaw # - Type - Remaining:

#425 - Grout Nozzle - 0.206"R



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TANK # 20 - QUADRANT C

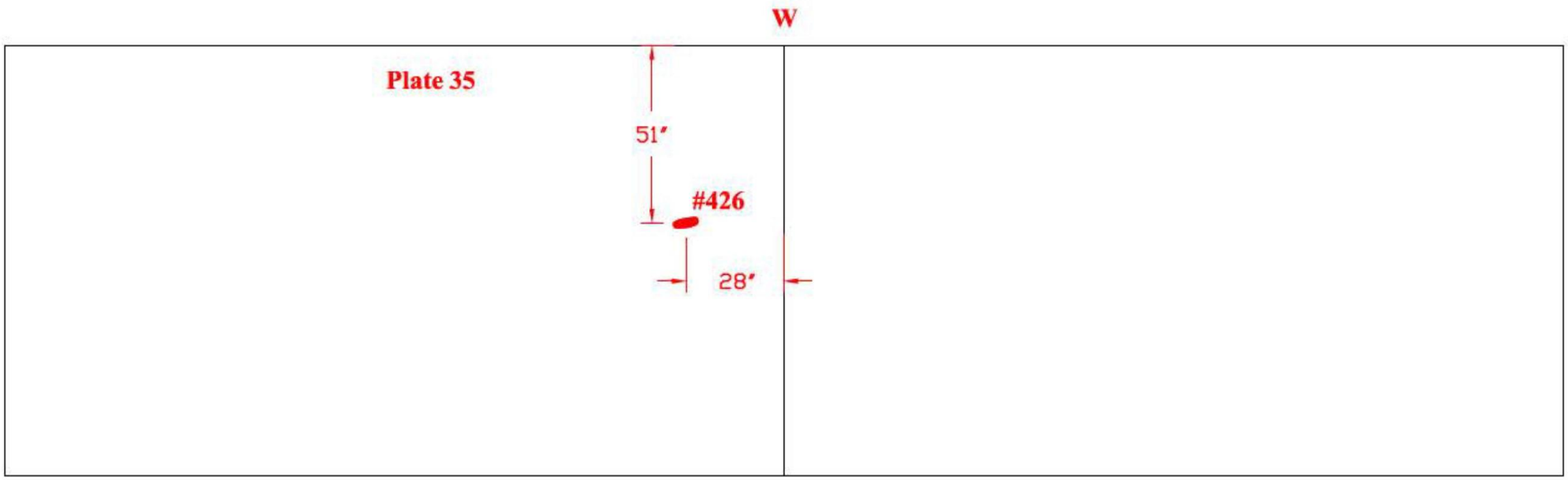
***Nominal Plate Thickness: 0.250"**

Tank Section: Upper Dome
Quadrant: C

Course: D
Plate #: 35

Flaw # - Type - Remaining:

#426 - Gouge - 0.244"D 2"L

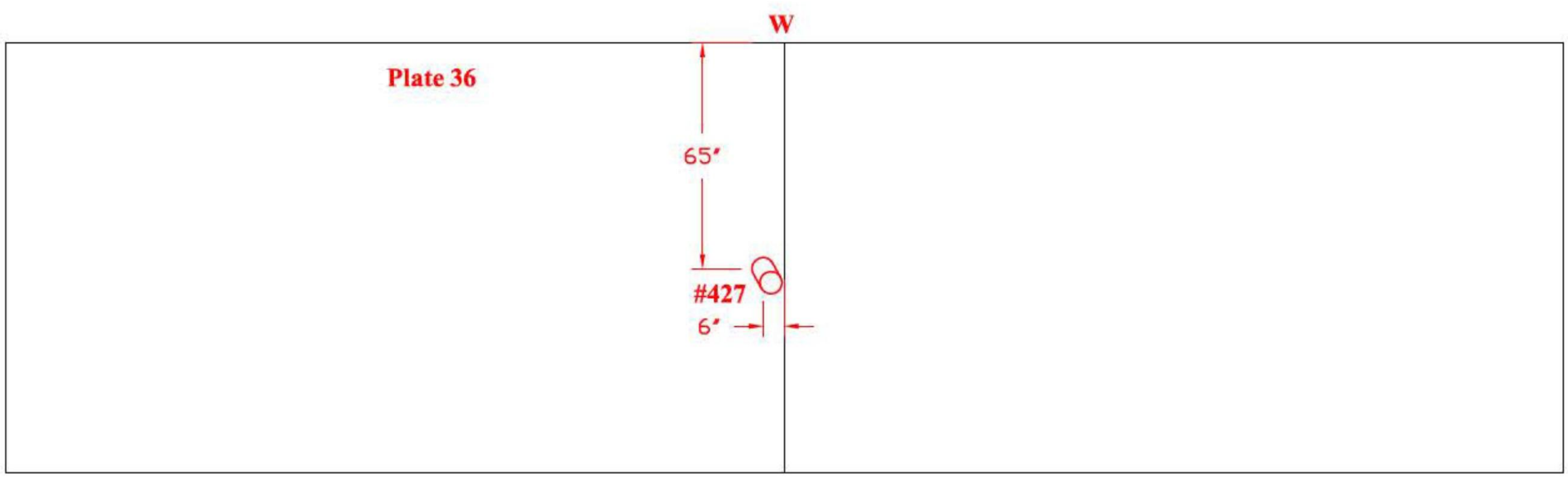


Tank Section:Upper Dome
Quadrant: C

Course: D
Plate #: 36

Flaw # - Type - Remaining:

#427 - Grout Nozzle - 0.200"R



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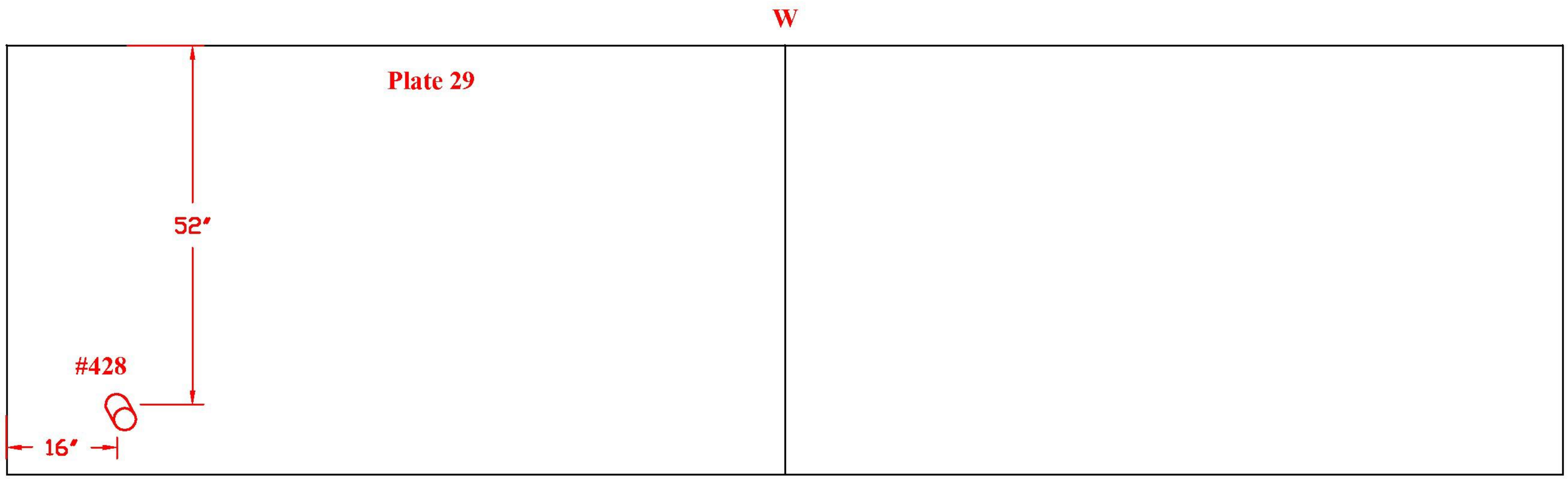
TANK # 20 - QUADRANT C
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: D
Plate #: 29

Flaw # - Type - Remaining:

#428 - Grout Nozzle - 0.204"R

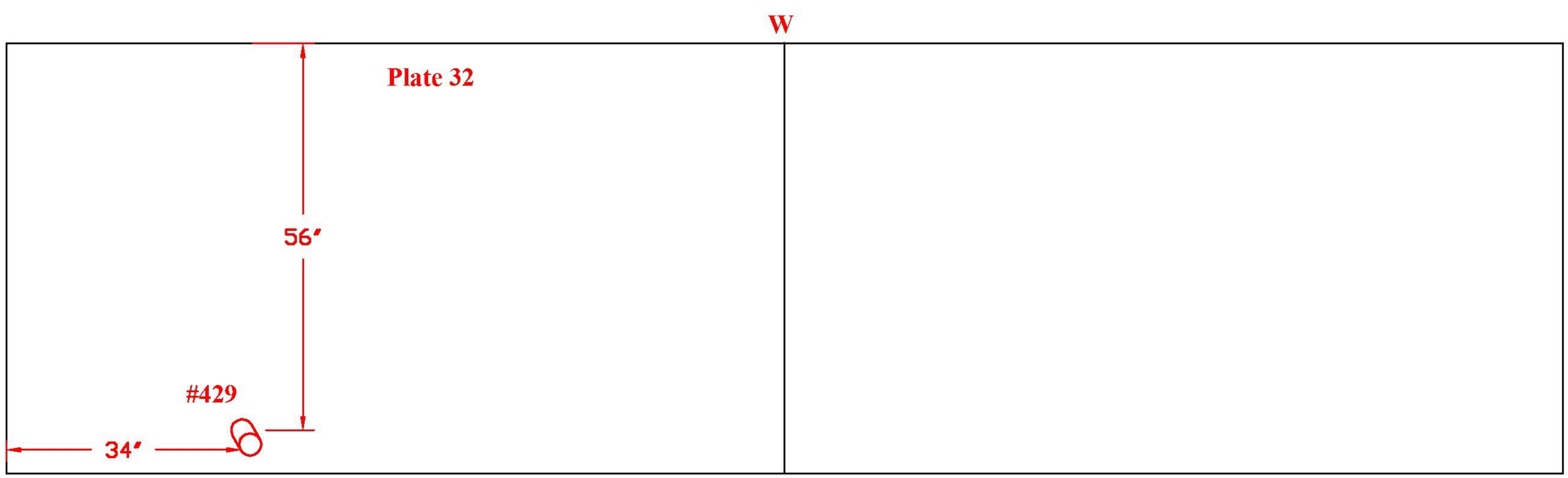


Tank Section:Upper Dome
Quadrant: C

Course: D
Plate #: 32

Flaw # - Type - Remaining:

#429 - Grout Nozzle - 0.205"R



Drawing is not to scale

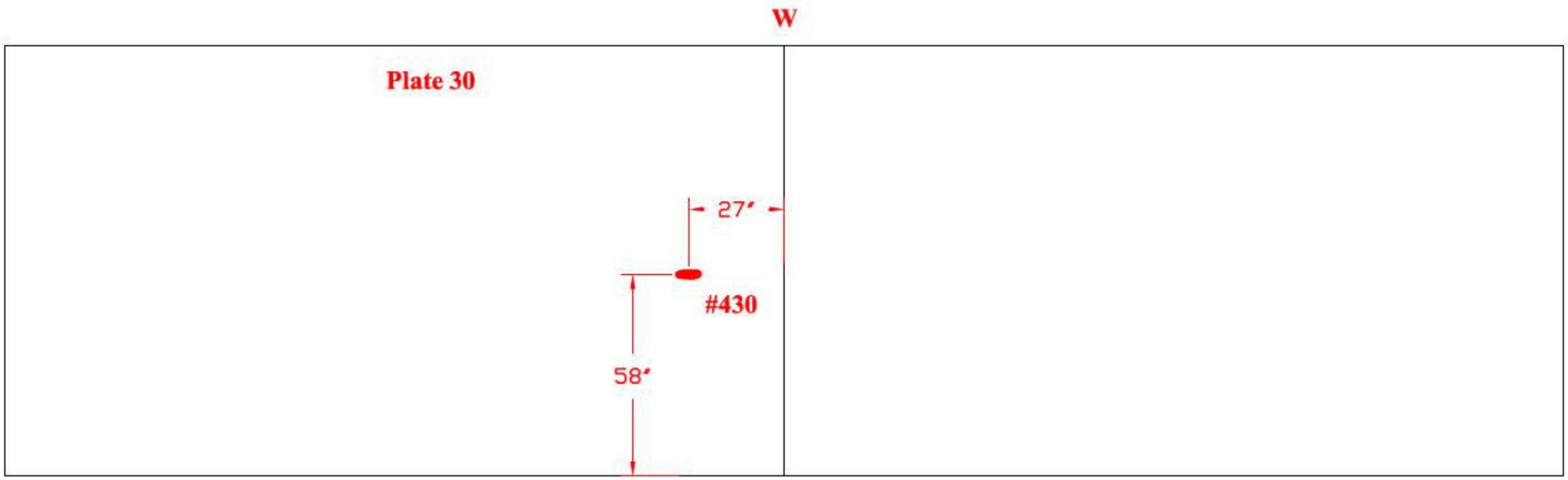
TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: C

Course: D
Plate #: 30

Flaw # - Type - Remaining:

#430 - Dent - 0.200" deep

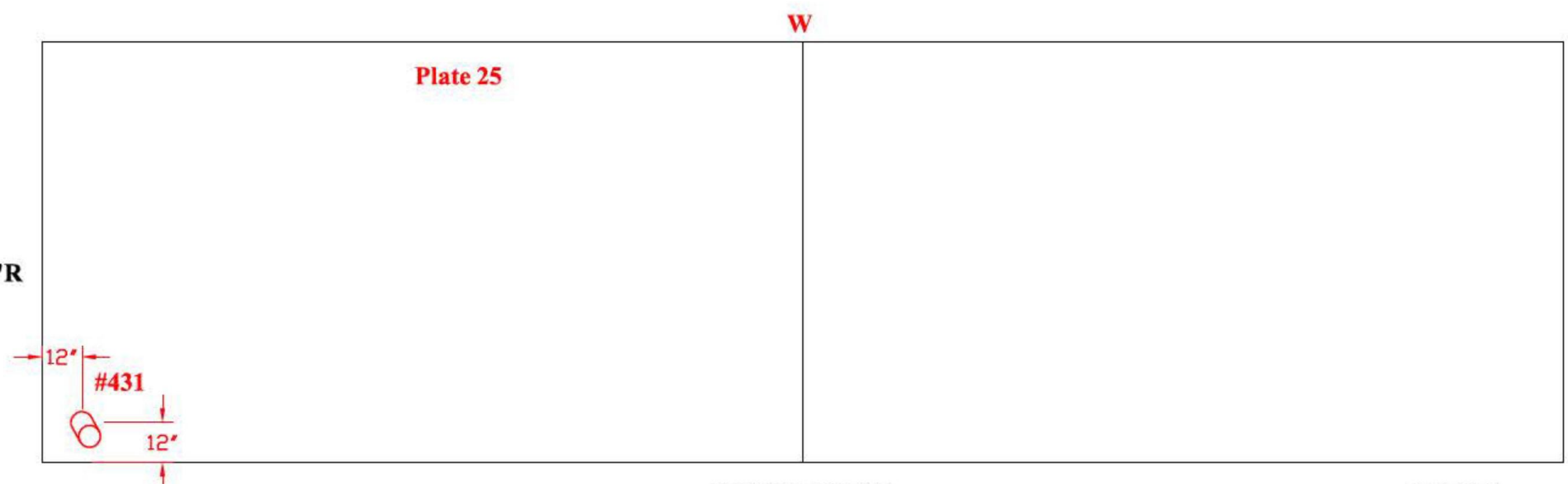


Tank Section:Upper Dome
Quadrant: D

Course: D
Plate #: 25

Flaw # - Type - Remaining:

#431 - Grout Nozzle - 0.223"R



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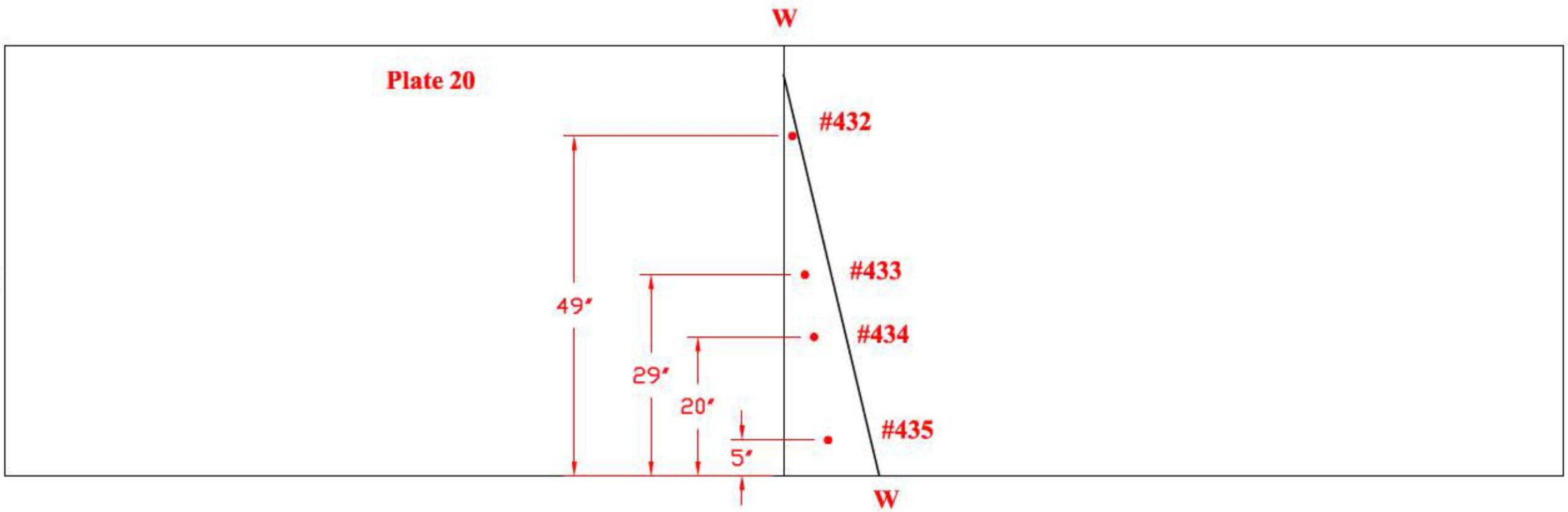
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: E
Plate #: 20

Flaw # - Type - Remaining:

#432 -TW - 0.090"deep 1.5"dia
#433 -TW - 0.077"deep 1"dia
#434 -TW - 0.090"deep 1"dia
#435 -TW - 0.075"deep 1"dia

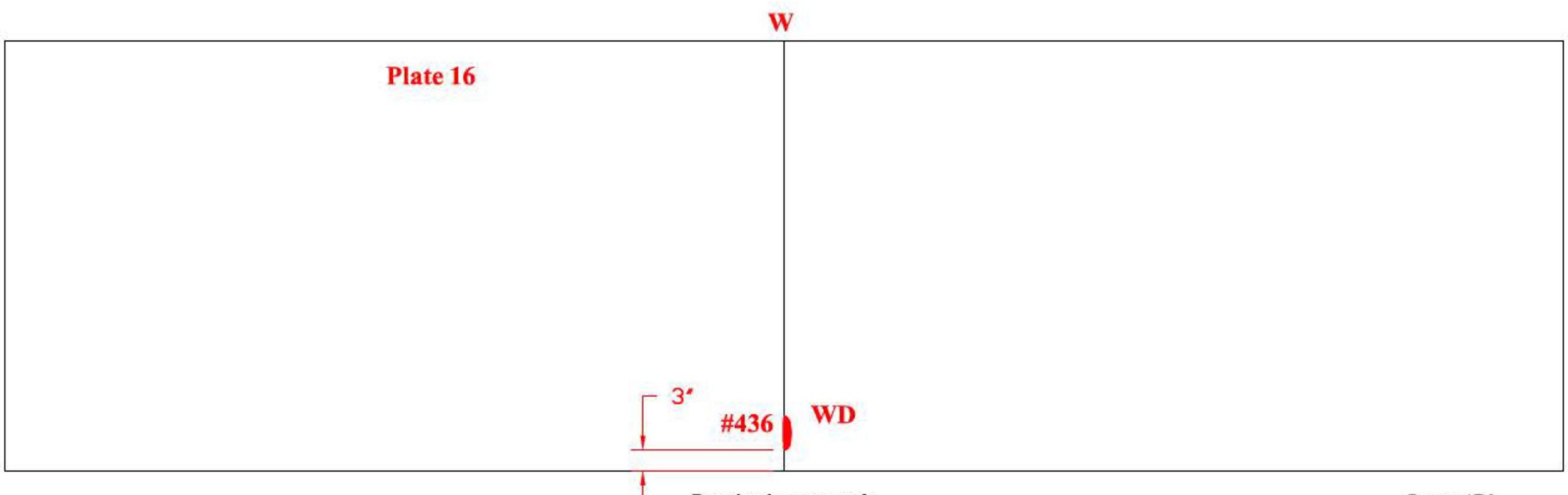


Tank Section:Upper Dome
Quadrant: C

Course: E
Plate #: 16

Flaw # - Type - Remaining:

#436 - LOF - 0.100"D 8"L



Drawing is not to scale

TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

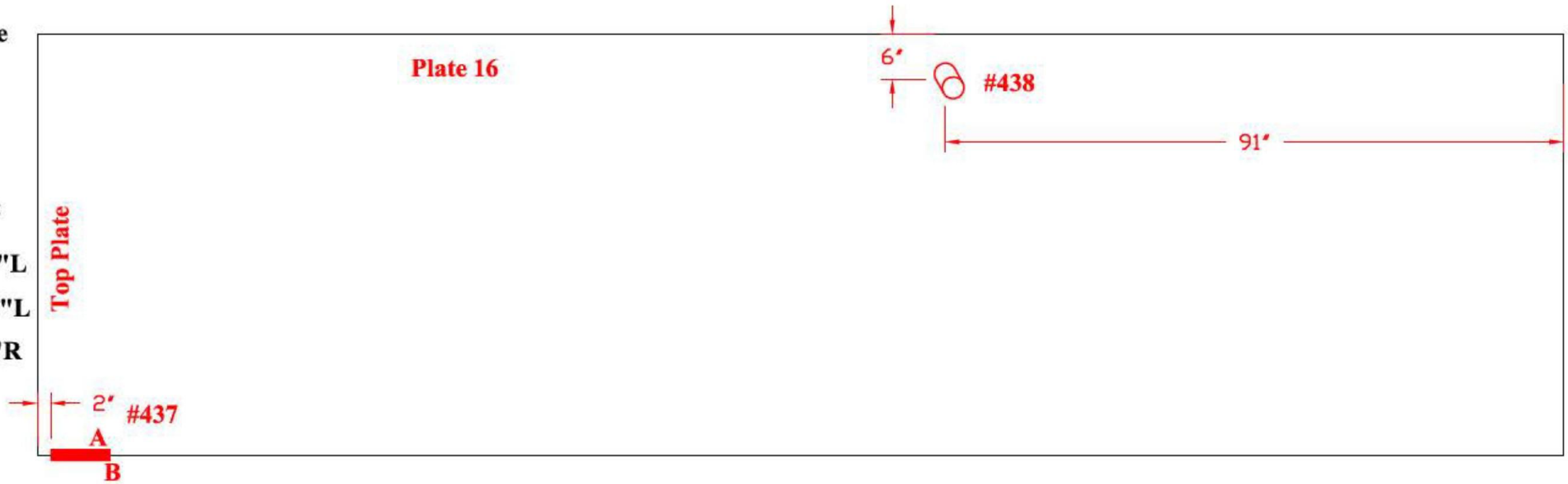
Tank Section: Upper Dome
Quadrant: B

Course: D
Plate #: 16

Flaw # - Type - Remaining:

#437: A) -LOF - 0.120"D 6"L
B) -LOF - 0.067"D 6"L

#438 - Grout Nozzle - 0.220"R

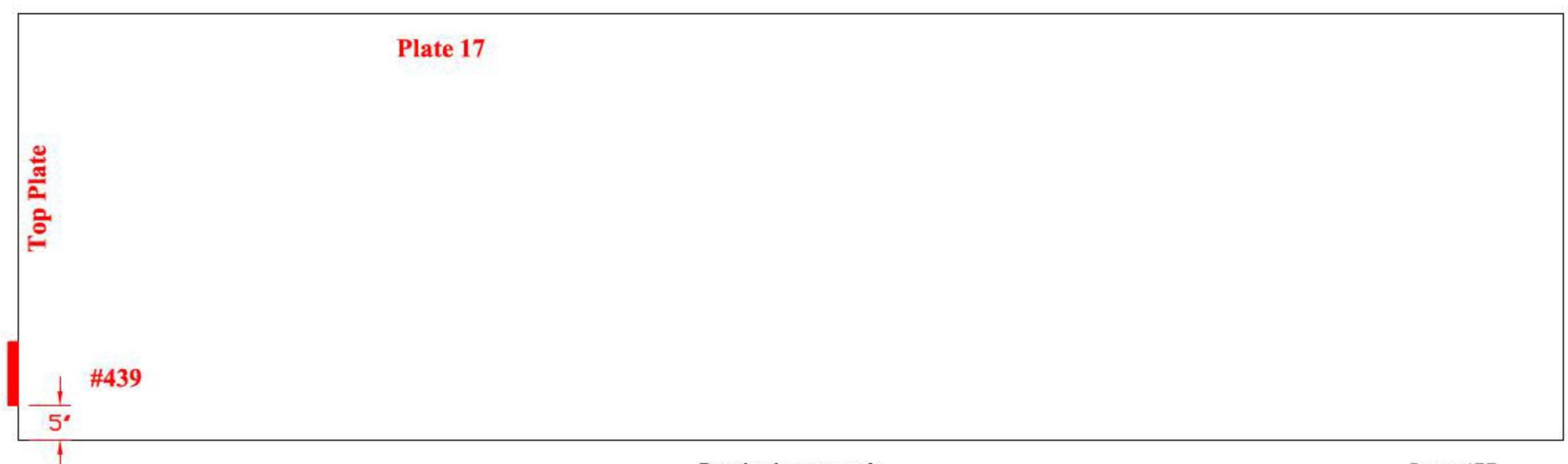


Tank Section:Upper Dome
Quadrant: B

Course: D
Plate #: 17

Flaw # - Type - Remaining:

#439 - LOF - 0.096"D 5"L



Drawing is not to scale

TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 6

Flaw # - Type - Remaining:

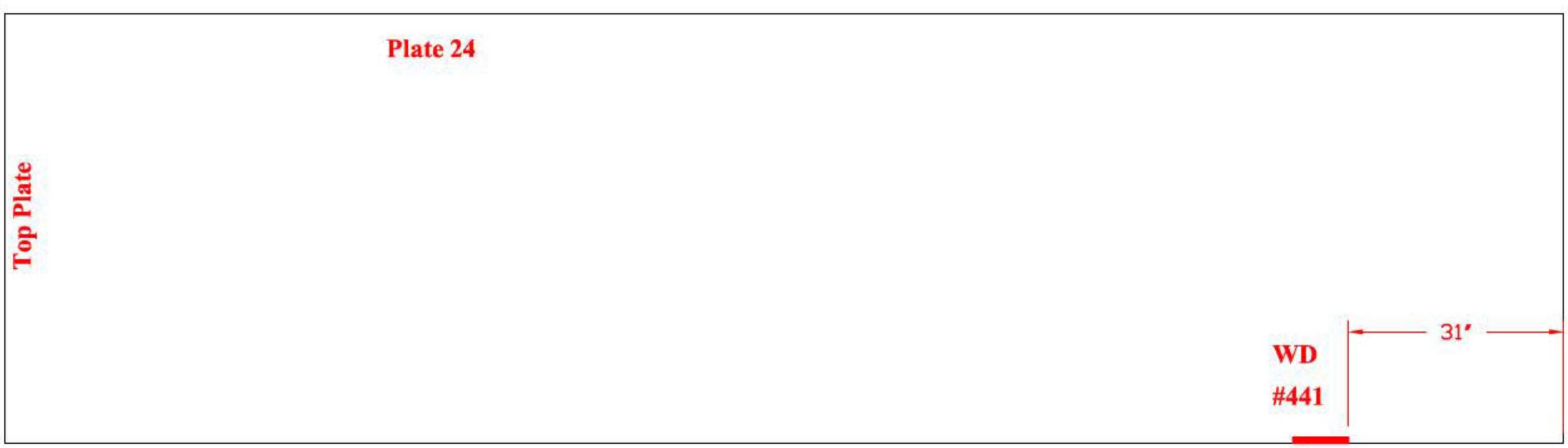
#440 - Grout Nozzle - 0.230"R

Tank Section:Upper Dome
Quadrant: B

Course: D
Plate #: 24

Flaw # - Type - Remaining:

#441 - LOF - 0.110"D 6"L



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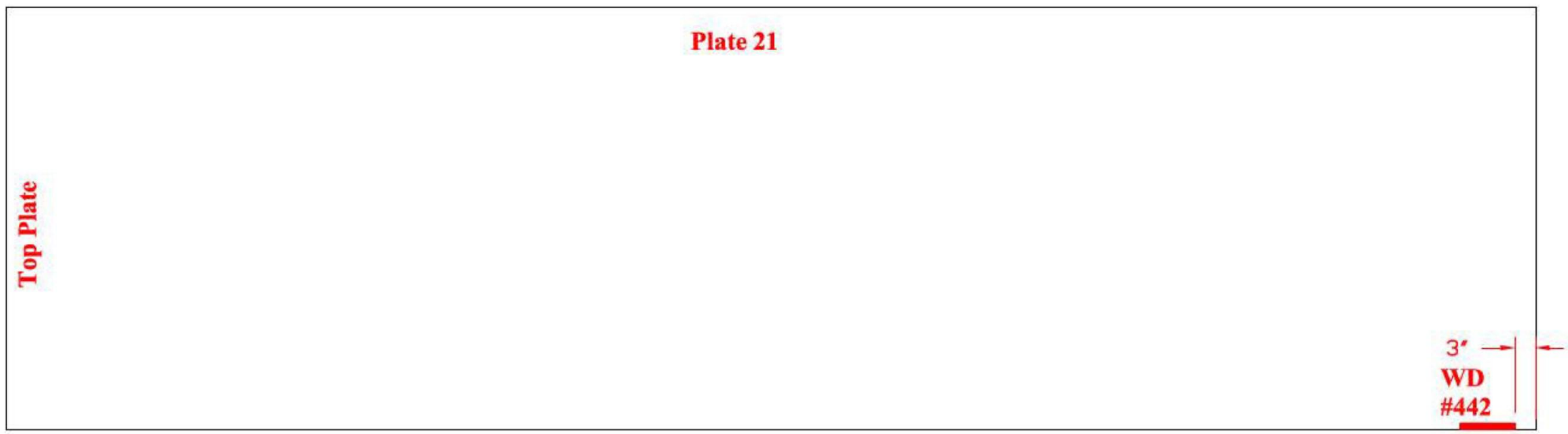
TANK # 20 - QUADRANT A AND B
**Nominal Plate Thickness: 0.250"*

Tank Section: Upper Dome
Quadrant: B

Course: D
Plate #: 21

Flaw # - Type - Remaining:

#442 - LOF - 0.185"D 5"L

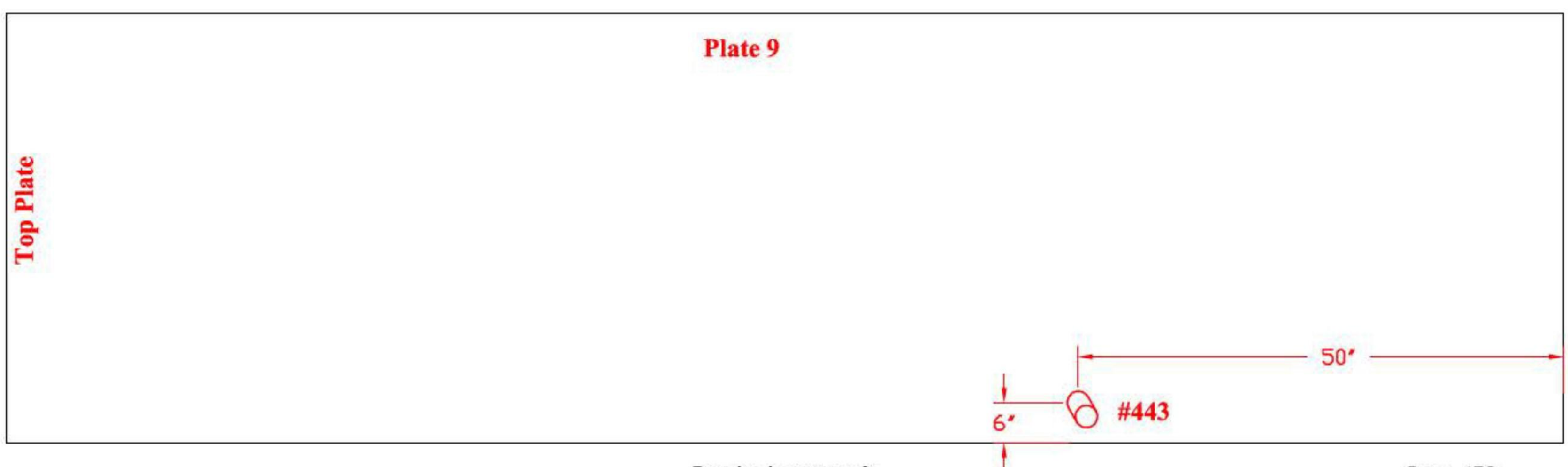


Tank Section:Upper Dome
Quadrant: A

Course: D
Plate #: 9

Flaw # - Type - Remaining:

#443 - Grout Nozzle - 0.210"R



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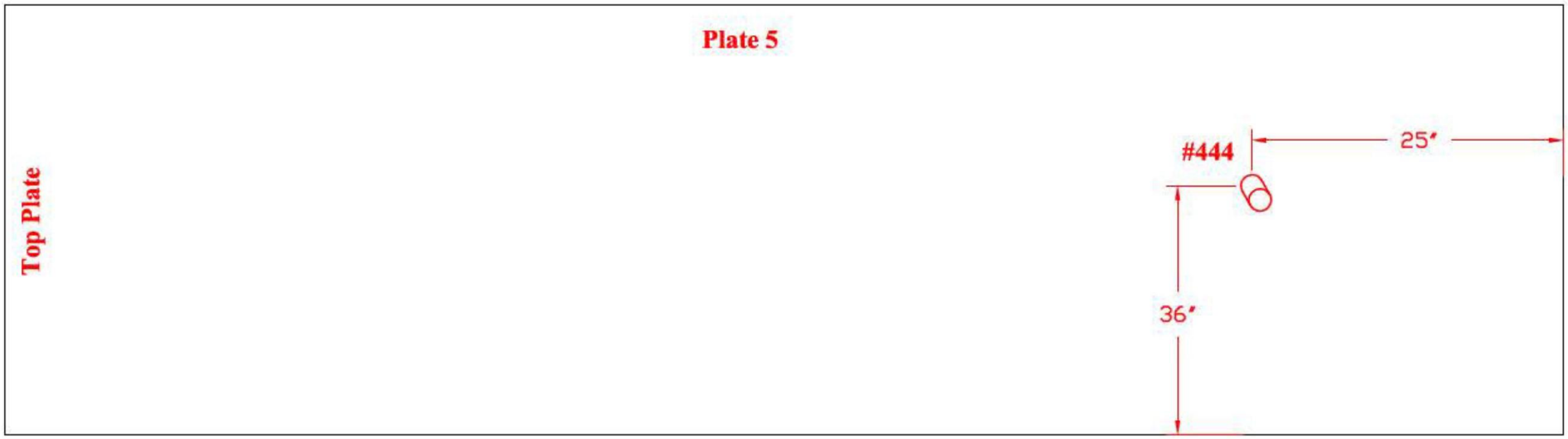
TANK # 20 - QUADRANT A AND B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: D
Plate #: 5

Flaw # - Type - Remaining:

#444 - Grout Nozzle - 0.205"R

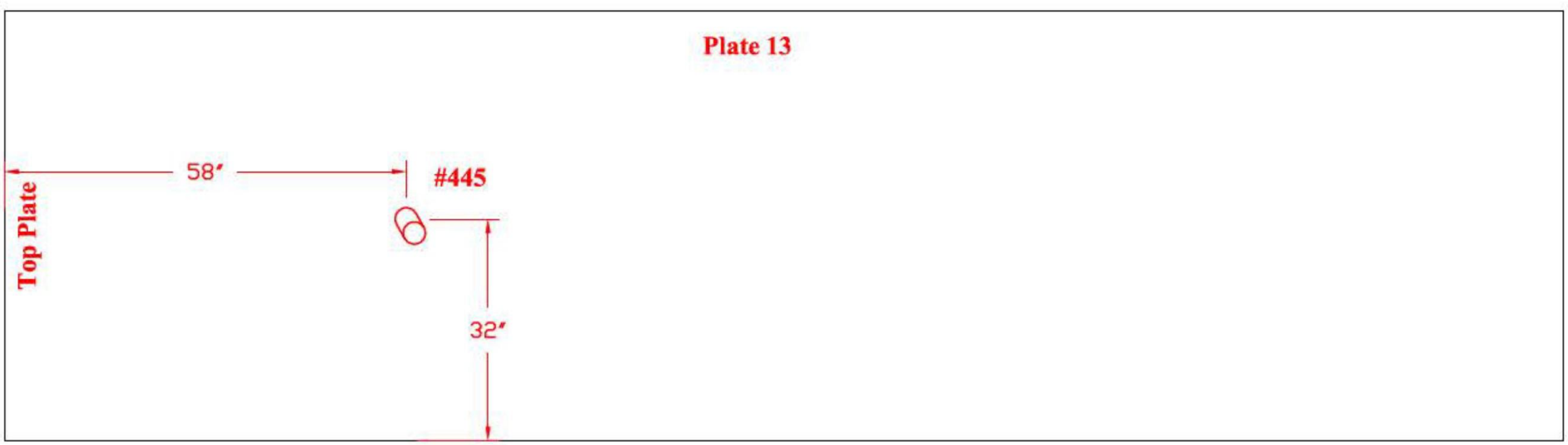


Tank Section:Upper Dome
Quadrant: B

Course: D
Plate #: 13

Flaw # - Type - Remaining:

#445 - Grout Nozzle - 0.210"R



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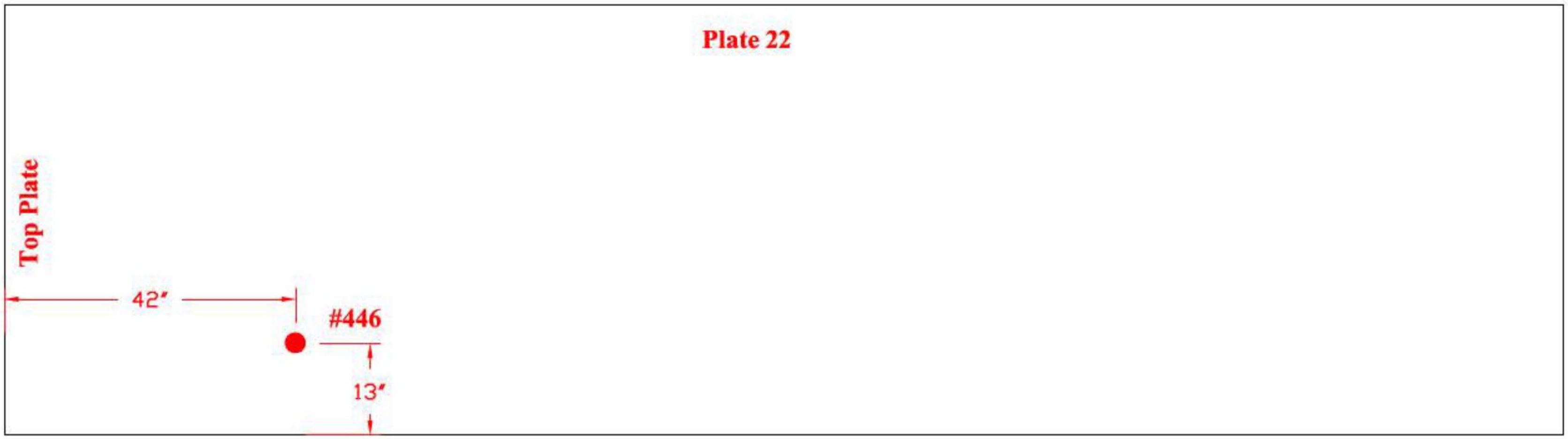
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: D
Plate #: 22

Flaw # - Type - Remaining:

#446 - Dent - 0.180"deep

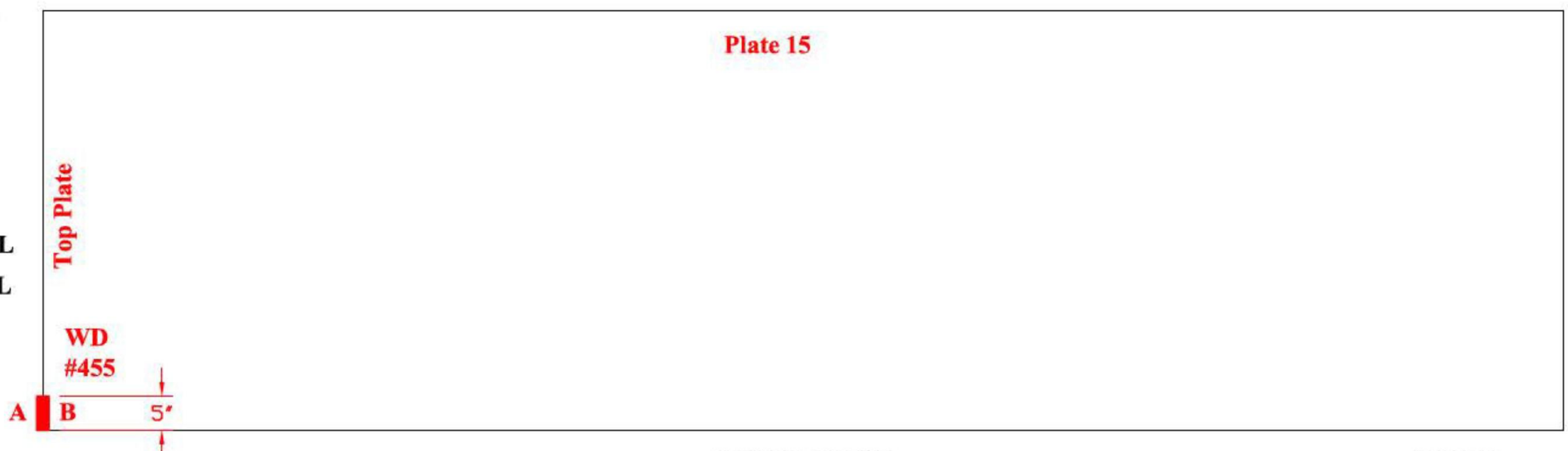


Tank Section: Upper Dome
Quadrant: B

Course: D
Plate #: 15

Flaw # - Type - Remaining:

#455: A) LOF - 0.099"D 5"L
B) LOF - 0.117"D 5"L



Drawing is not to scale

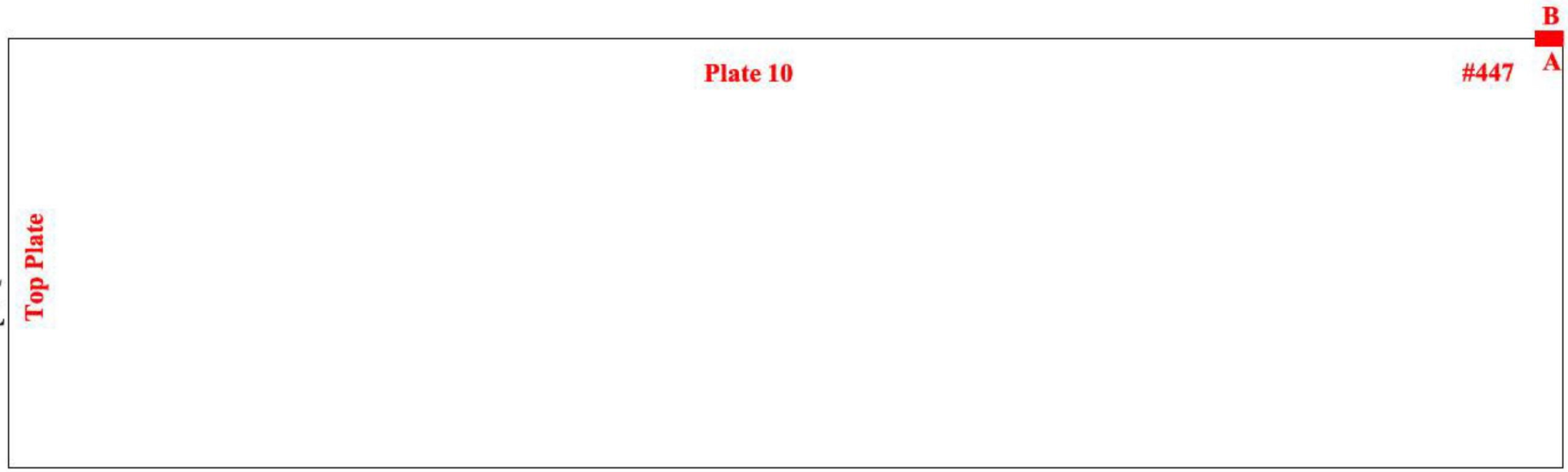
TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: B

Course: E
Plate #: 10

Flaw # - Type - Remaining:

#447: A) LOF - 0.193"D 3.5"L
B) LOF - 0.235"D 3.5"L



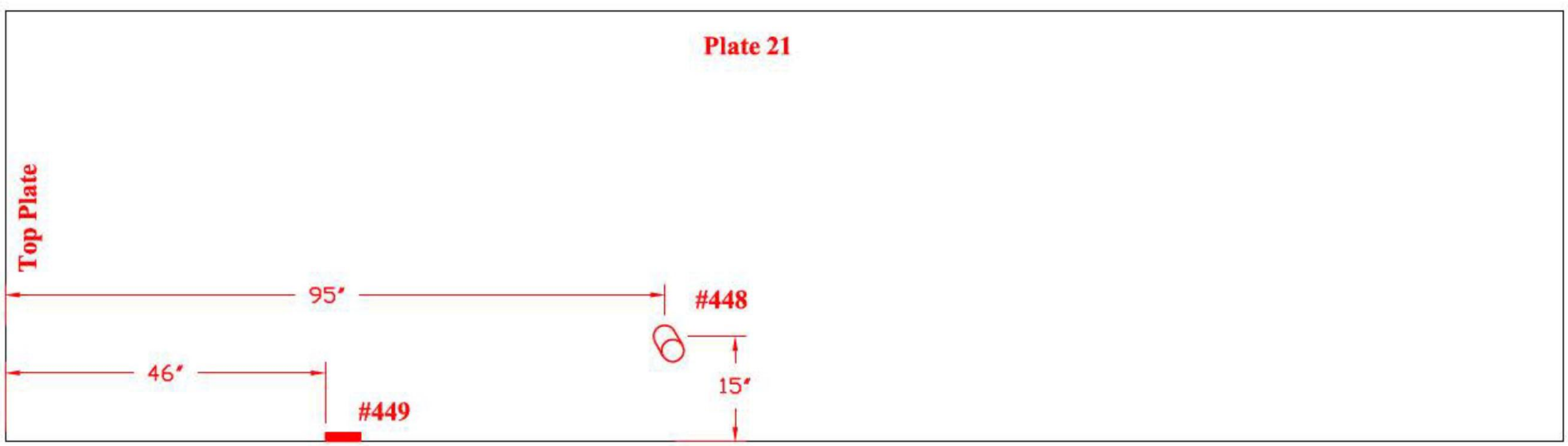
Tank Section: Upper Dome
Quadrant: B

Course: D
Plate #: 21

Flaw # - Type - Remaining:

#448 - Grout Nozzle - 0.215"R

#449 - LOF - 0.214"D 3"L



Drawing is not to scale

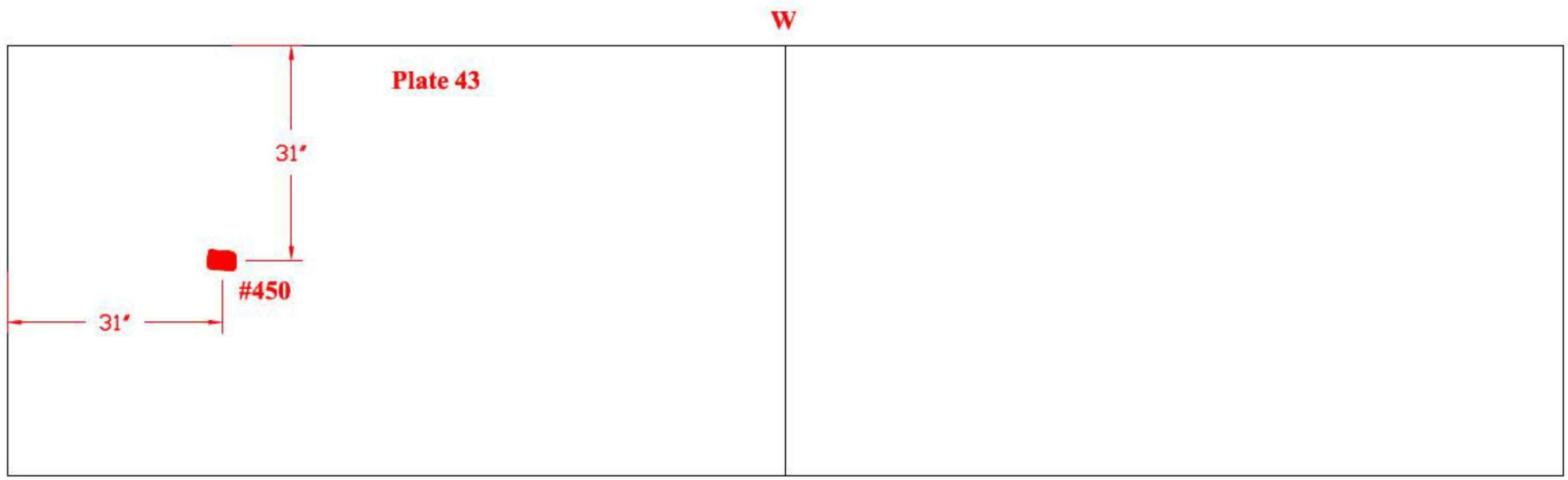
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: D
Plate #: 43

Flaw # - Type - Remaining:

#450 - Dent - 0.190" deep

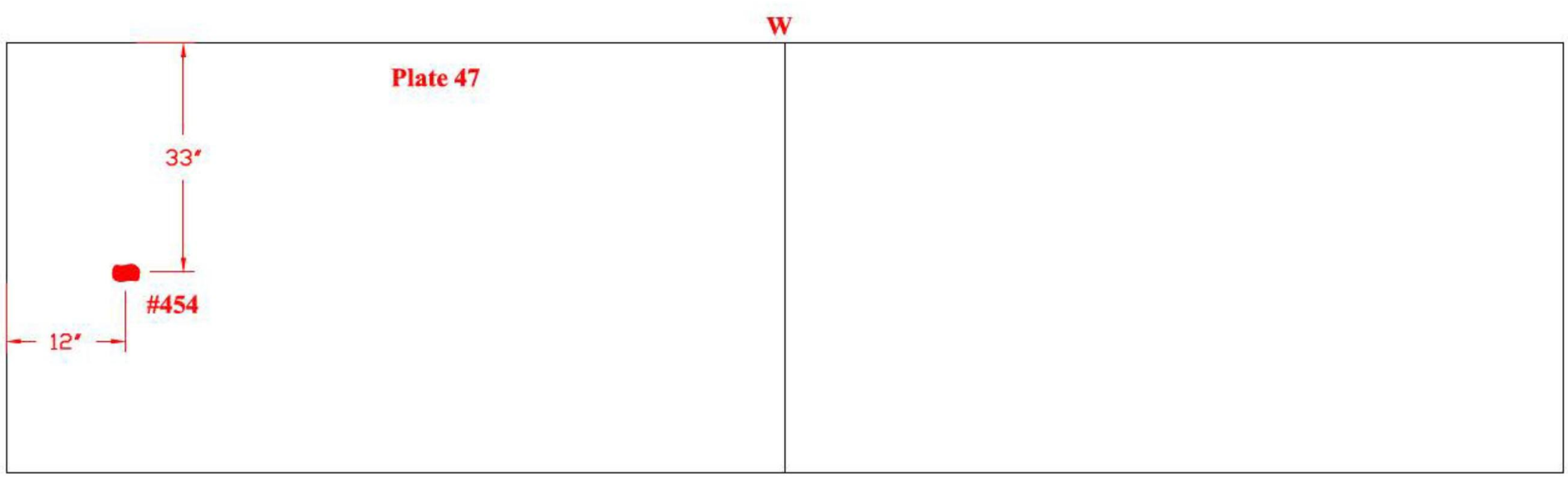


Tank Section:Upper Dome
Quadrant: D

Course: D
Plate #: 47

Flaw # - Type - Remaining:

#454 - Dent - 0.200" deep



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

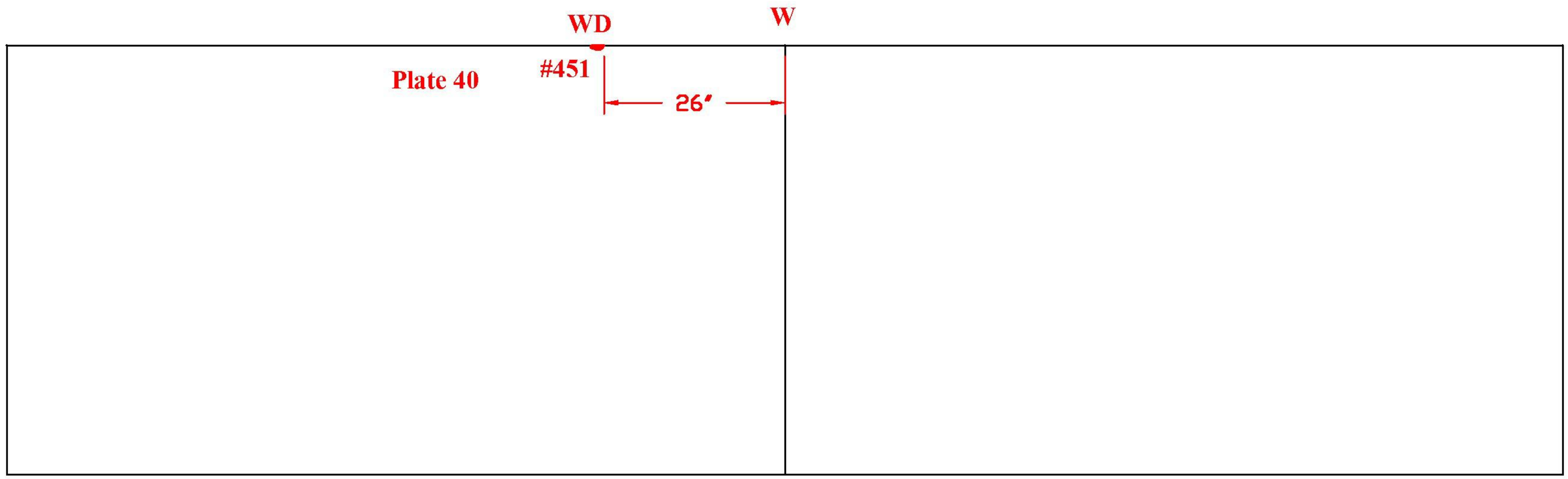
TANK # 20 - QUADRANT C AND D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: C
Plate #: 40

Flaw # - Type - Remaining:

#451 - LOF - 0.085"D 2"L



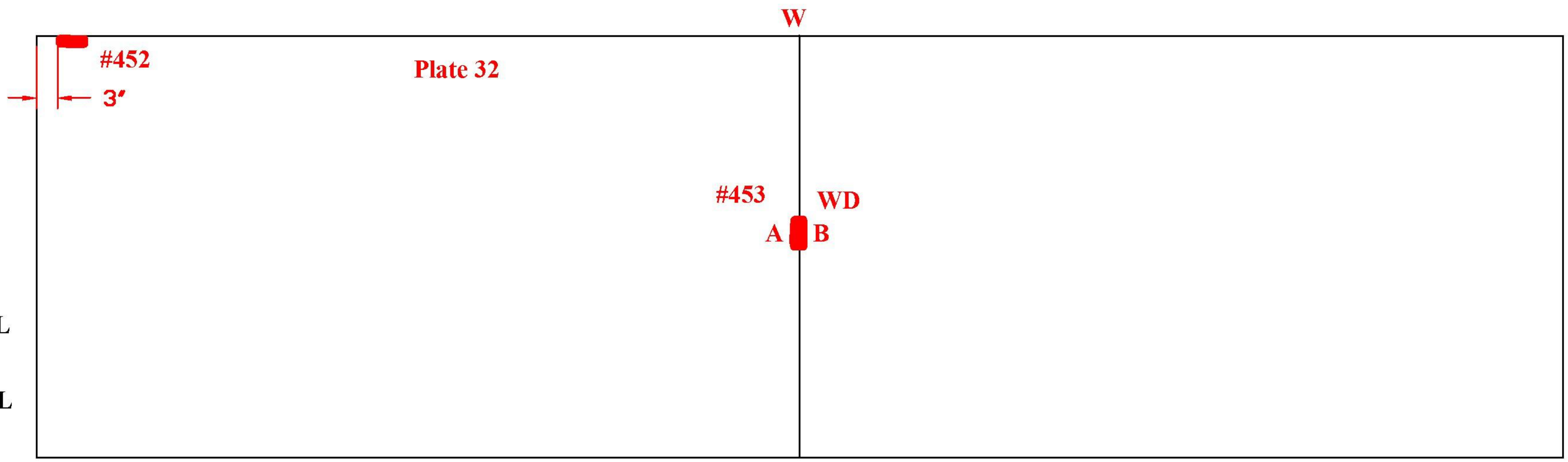
Tank Section: Upper Dome
Quadrant: C

Course: D
Plate #: 32

Flaw # - Type - Remaining:

#452 - LOF - 0.099"D 3"L

#453: A) LOF - 0.196"D 6"L
Pit - 0.1875" dia
B) LOF - 0.101"D 6"L



Drawing is not to scale

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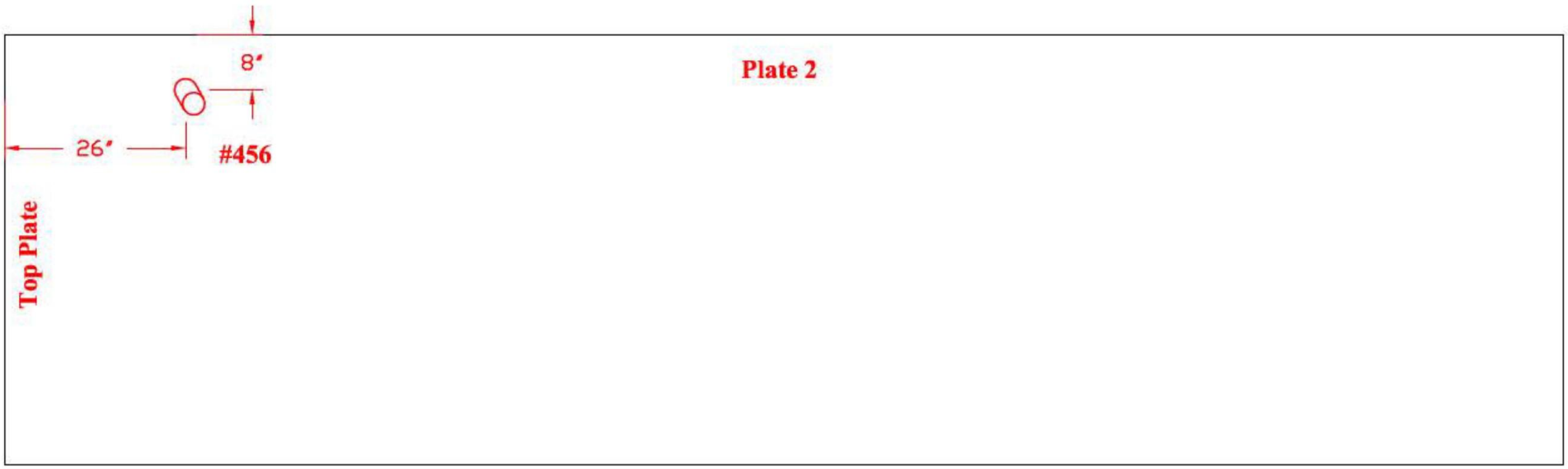
TANK # 20 - QUADRANT A AND D
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 2
Plate #: 2

Flaw # - Type - Remaining:

#456 - Grout Nozzle - 0.212"R

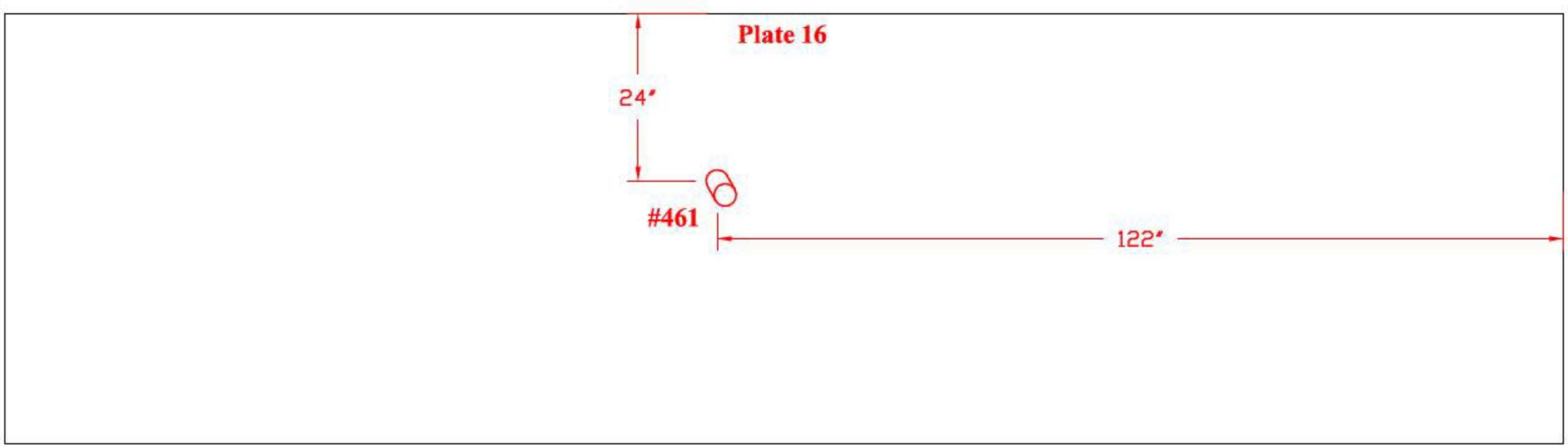


Tank Section: Barrel
Quadrant: D

Course: 12
Plate #: 16

Flaw # - Type - Remaining:

#461 - Grout Nozzle - 0.211"R



Drawing is not to scale

TesTex
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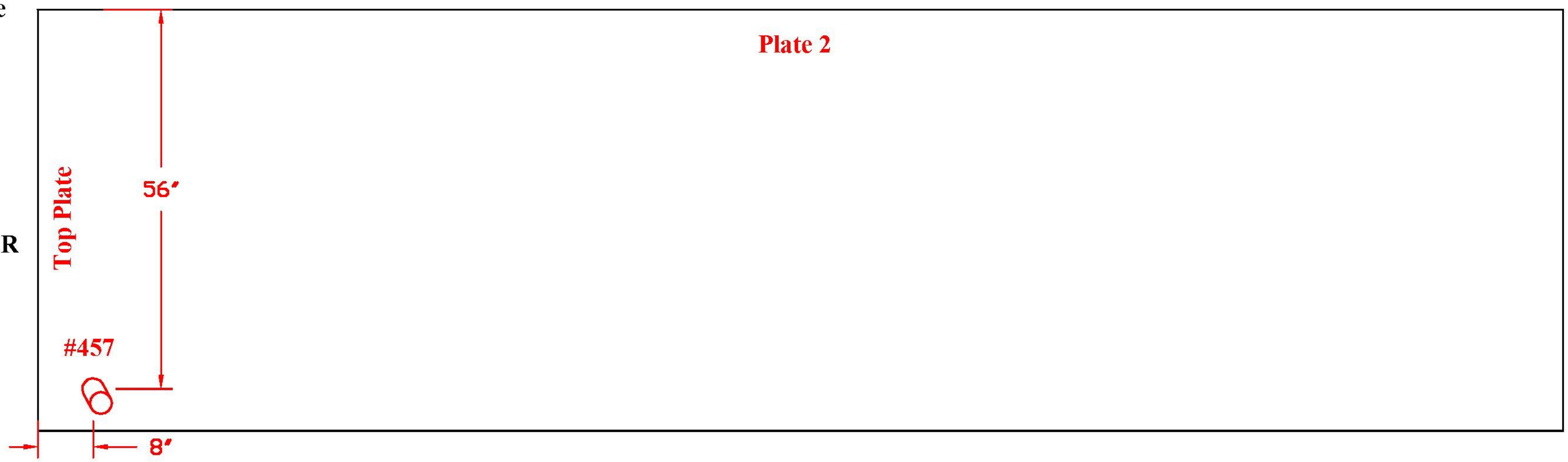
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Lower Dome
Quadrant: A

Course: 4
Plate #: 2

Flaw # - Type - Remaining:

#457 - Grout Nozzle - 0.230"R

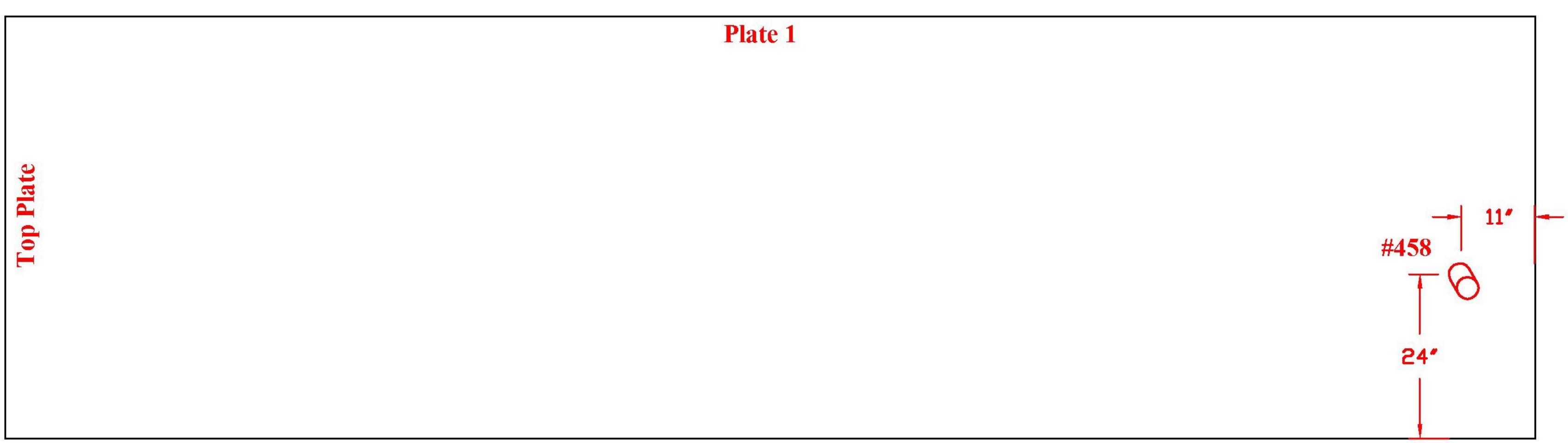


Tank Section: Lower Dome
Quadrant: A

Course: 3
Plate #: 1

Flaw # - Type - Remaining:

#458 - Grout Nozzle - 0.200"R



Drawing is not to scale

TesTex
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TANK # 20 - QUADRANT A

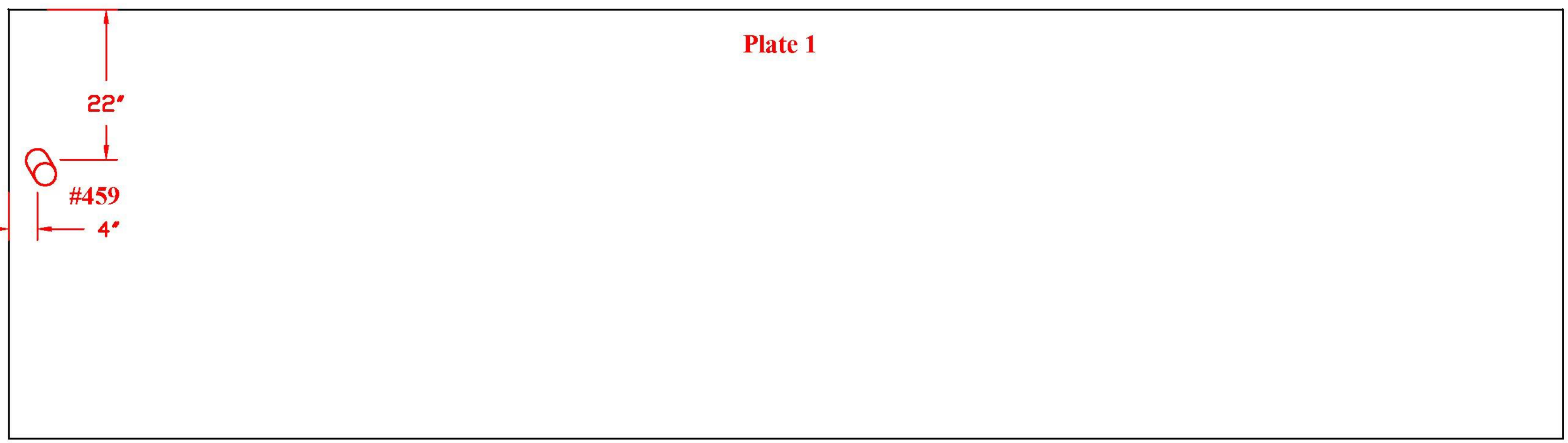
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 5
Plate #: 1

Flaw # - Type - Remaining:

#459 - Grout Nozzle - 0.220"R

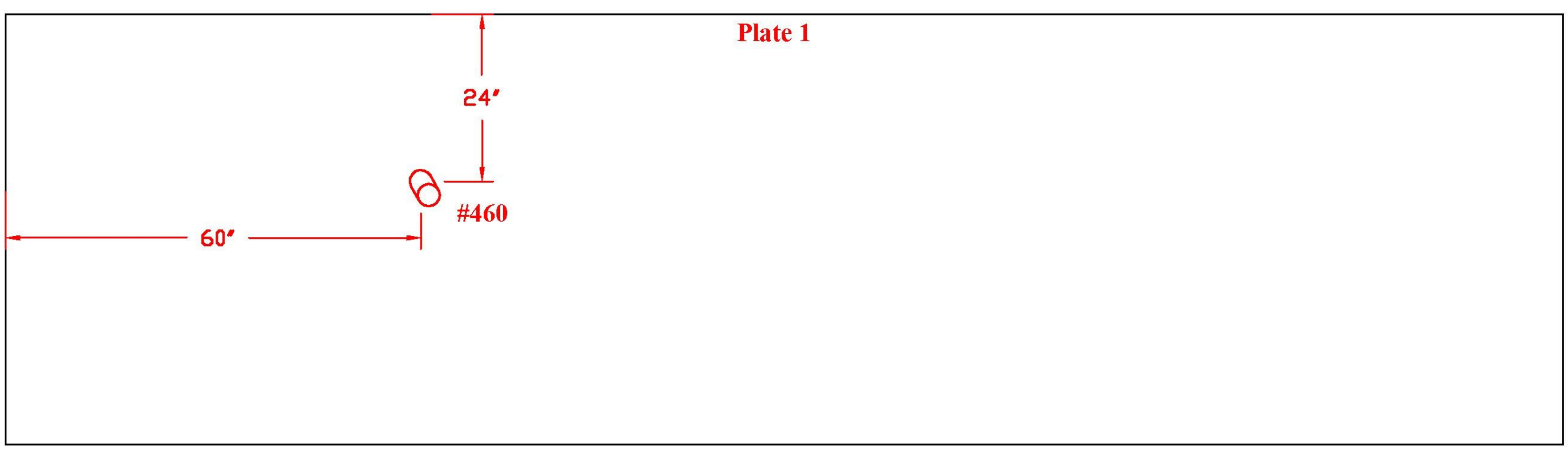


Tank Section: Barrel
Quadrant: A

Course: 1
Plate #: 1

Flaw # - Type - Remaining:

#460 - Grout Nozzle - 0.209"R



Drawing is not to scale

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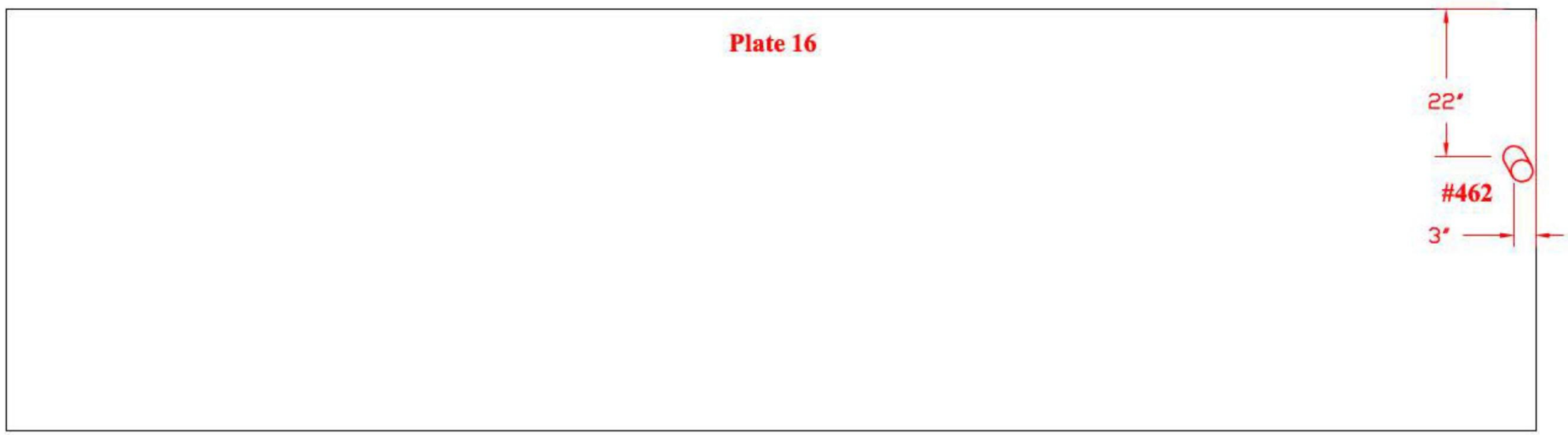
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 19
Plate #: 16

Flaw # - Type - Remaining:

#462 - Grout Nozzle - 0.216"R

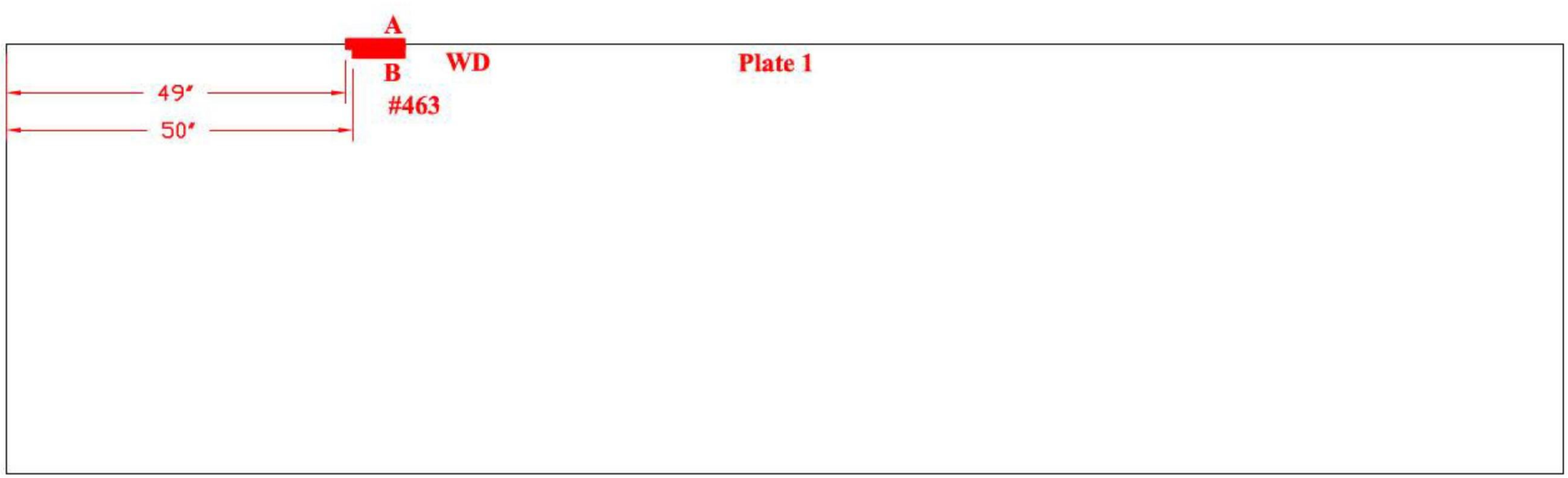


Tank Section: Barrel
Quadrant: A

Course: 26
Plate #: 1

Flaw # - Type - Remaining:

#463: A) LOF - 0.077"D 9"L
B) LOF - 0.088"D 8"L



Drawing is not to scale

TANK # 20 - QUADRANT A AND D

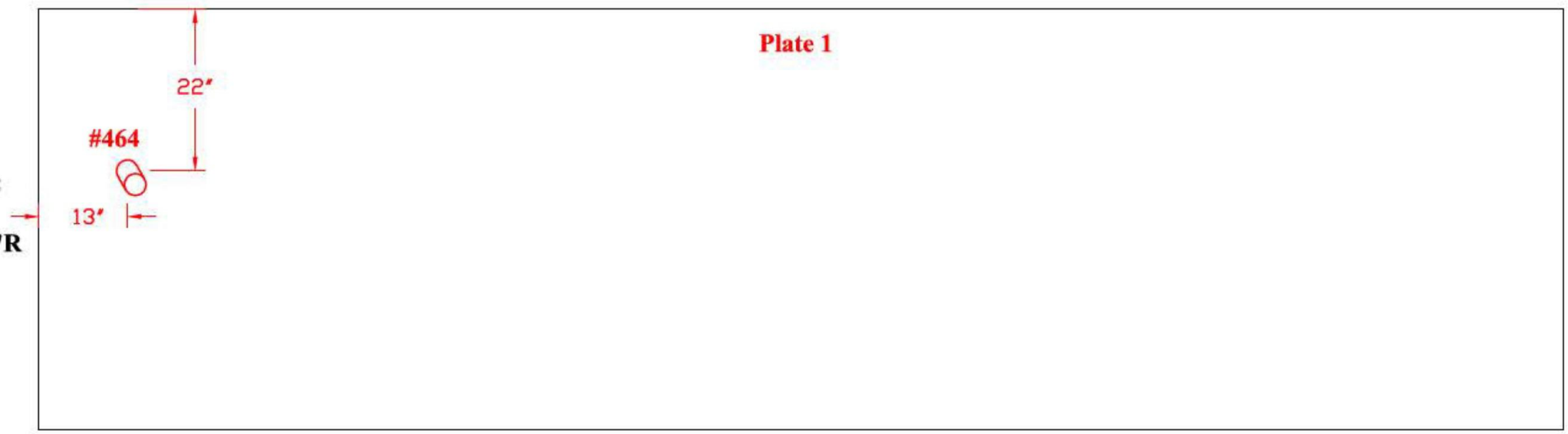
Nominal Plate Thickness: 0.250"

Tank Section: Barrel
Quadrant: A

Course: 27
Plate #: 1

Flaw # - Type - Remaining:

#464 - Grout Nozzle - 0.205"R

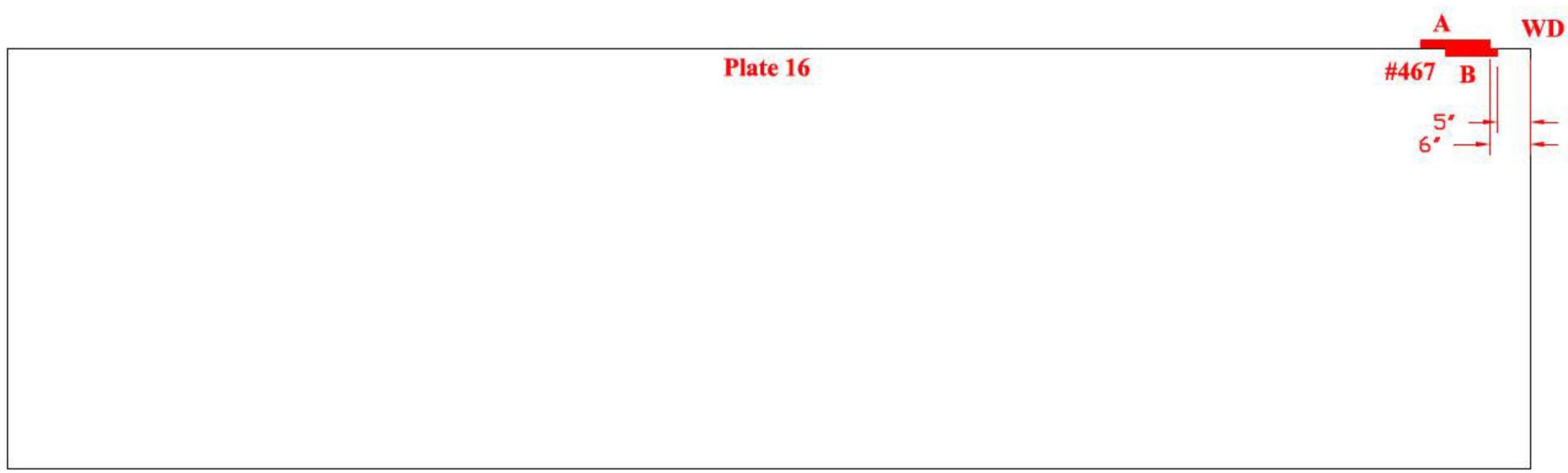


Tank Section: Barrel
Quadrant: D

Course: 26
Plate #: 16

Flaw # - Type - Remaining:

#467: A) LOF - 0.079"D 9"L
B) LOF - 0.083"D 8"L



Drawing is not to scale

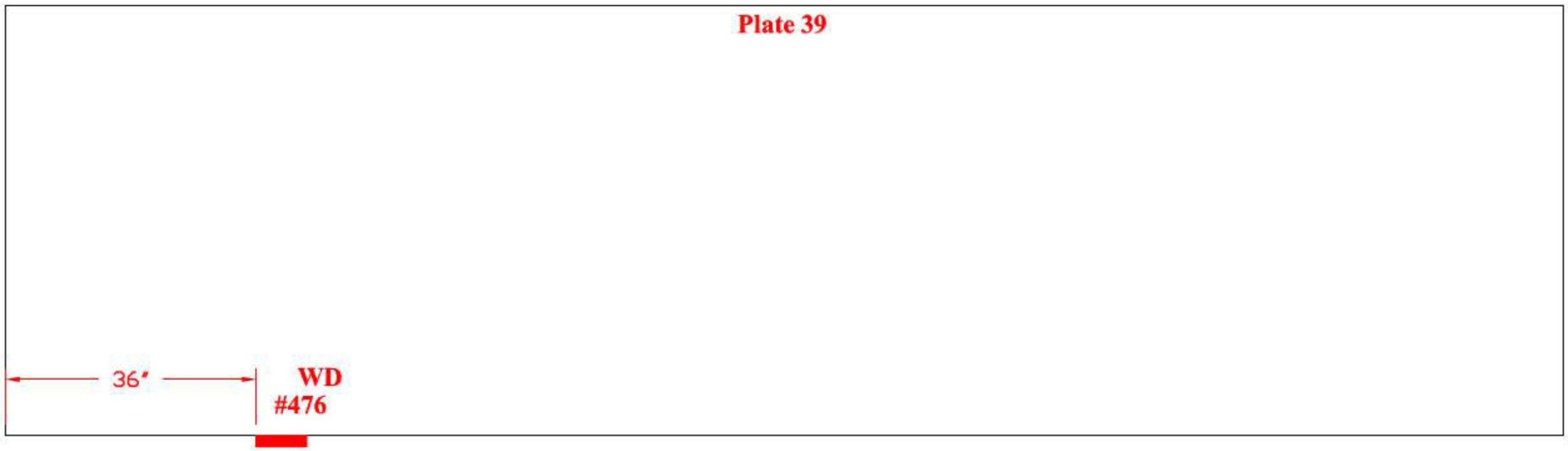
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Extension
Quadrant: D

Course: 4
Plate #: 39

Flaw # - Type - Remaining:

#476 - LOF - 0.120"D 6.5"L



Drawing is not to scale

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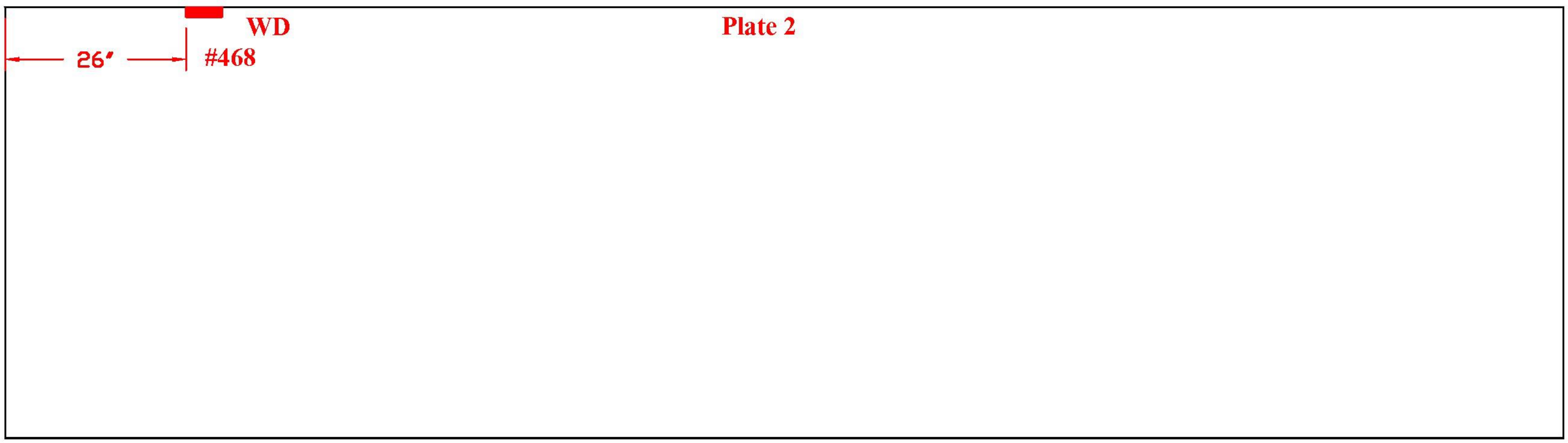
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Catwalk
Quadrant: A

Course: 3
Plate #: 2

Flaw # - Type - Remaining:

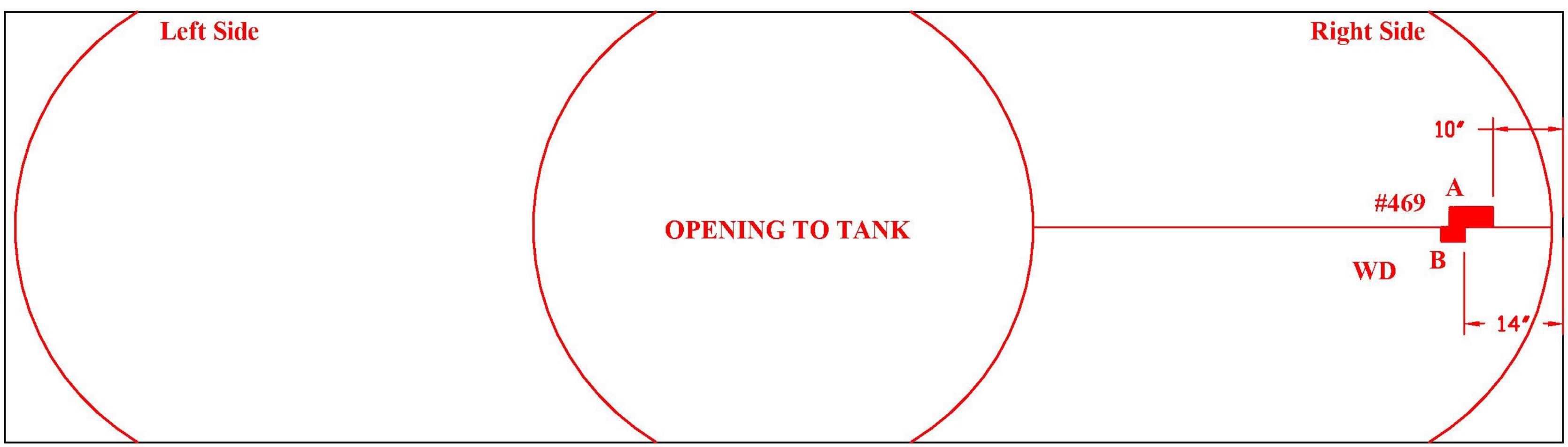
#468 - LOF - 0.077"D 1.5"L



Tank Section: Manway
Quadrant: A

Course: 3
Plate #:
Flaw # - Type - Remaining:

#469: A)LOF - 0.136"D 5"L
B)LOF- 0.239"D 0.075"L



Drawing is not to scale

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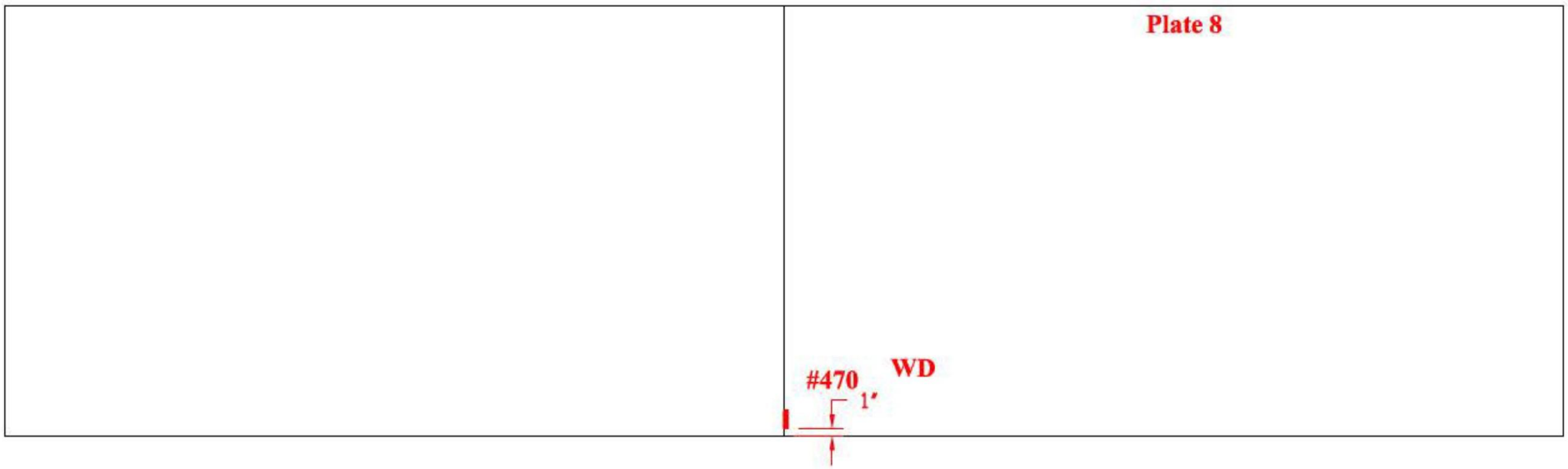
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: A
Plate #: 8

Flaw # - Type - Remaining:

#470 - LOF - 0.101"D 3"L

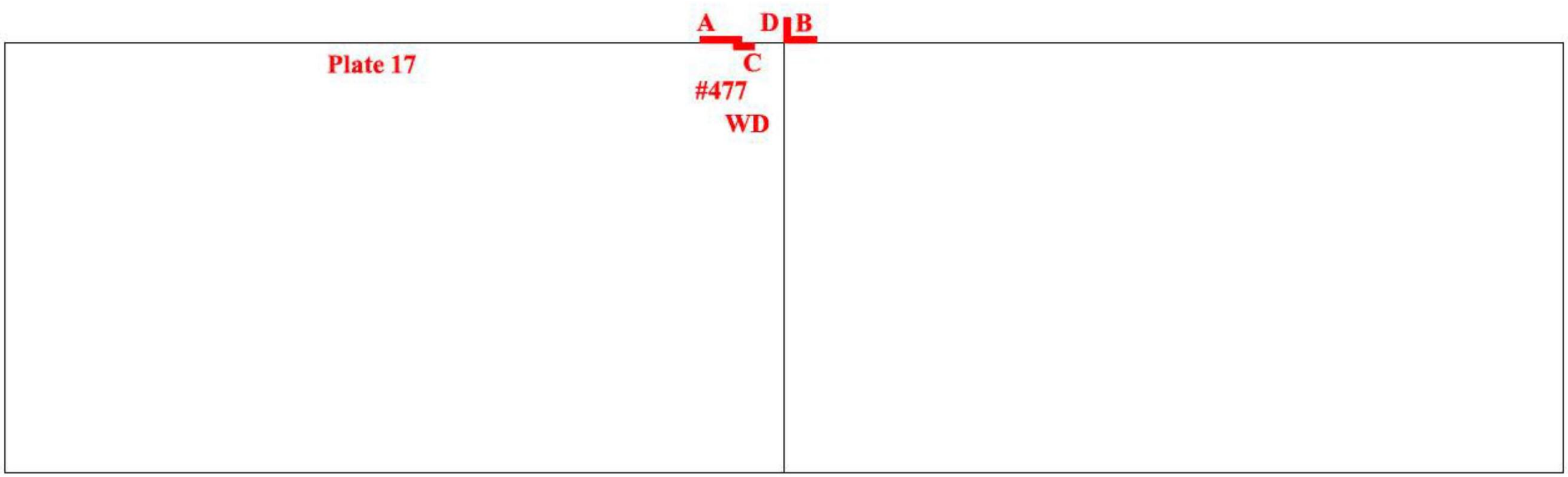


Tank Section: Upper Dome
Quadrant: A

Course: A
Plate #: 17

Flaw # - Type - Remaining:

#477/#358
- **A)LOF- 0.069"D 2.5"L**
- **B)LOF- 0.184"D 3"L**
- **C)LOF- 0.089"D 1.5"L**
- **D)LOF- 0.184"D 1.5"L**



Drawing is not to scale

TANK # 20 - QUADRANT B
Nominal Plate Thickness: 0.250"

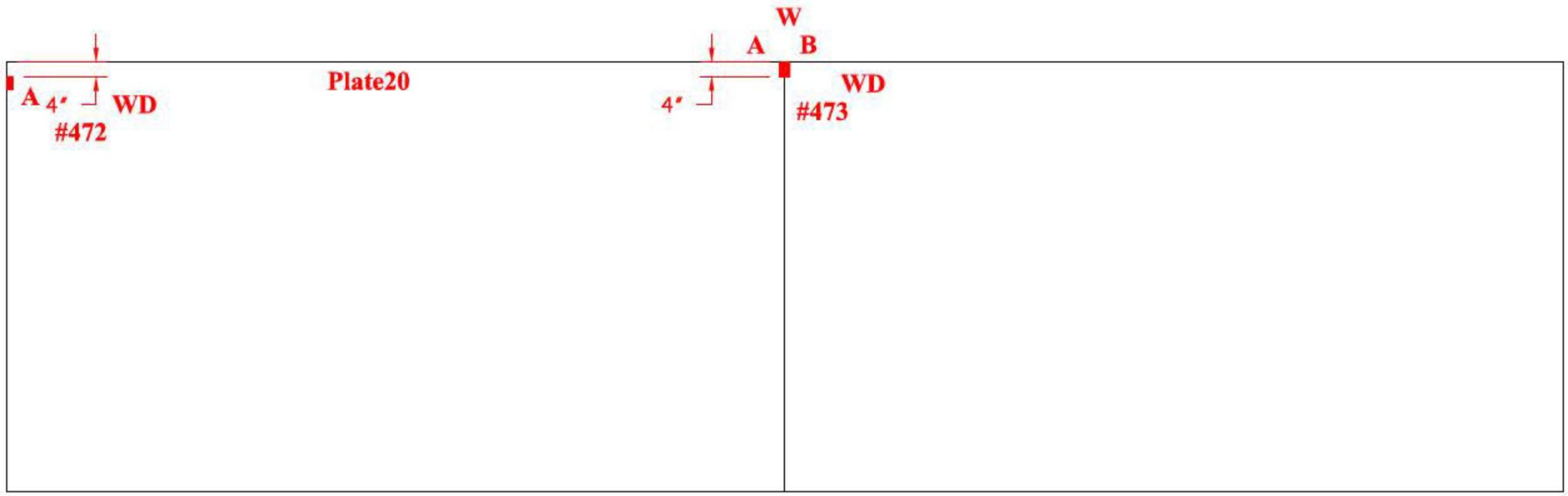
Tank Section: Upper Dome
Quadrant: B

Course: B
Plate #: 20

Flaw # - Type - Remaining:

#472 - LOF - 0.214"D 1.5"L

#473: A) LOF - 0.087"D 4"L
B) LOF - 0.127"D 4"L

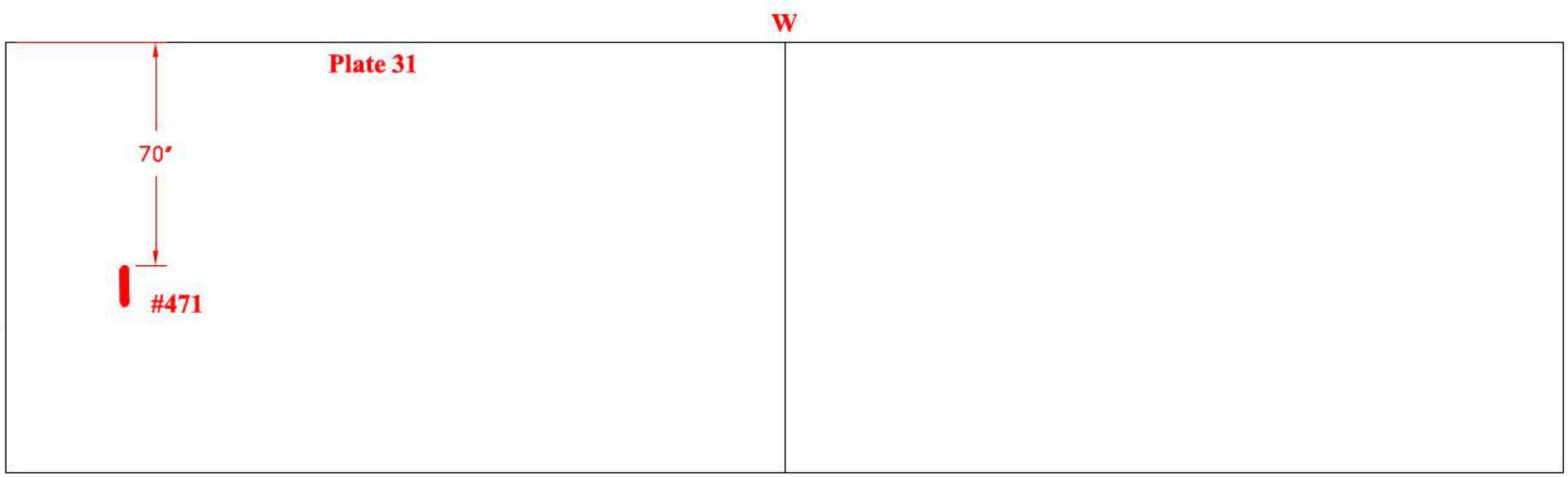


Tank Section: Upper Dome
Quadrant: B

Course: A
Plate #: 31

Flaw # - Type - Remaining:

#471
TW - BM - LOF - 0.071"D 3"L



Drawing is not to scale

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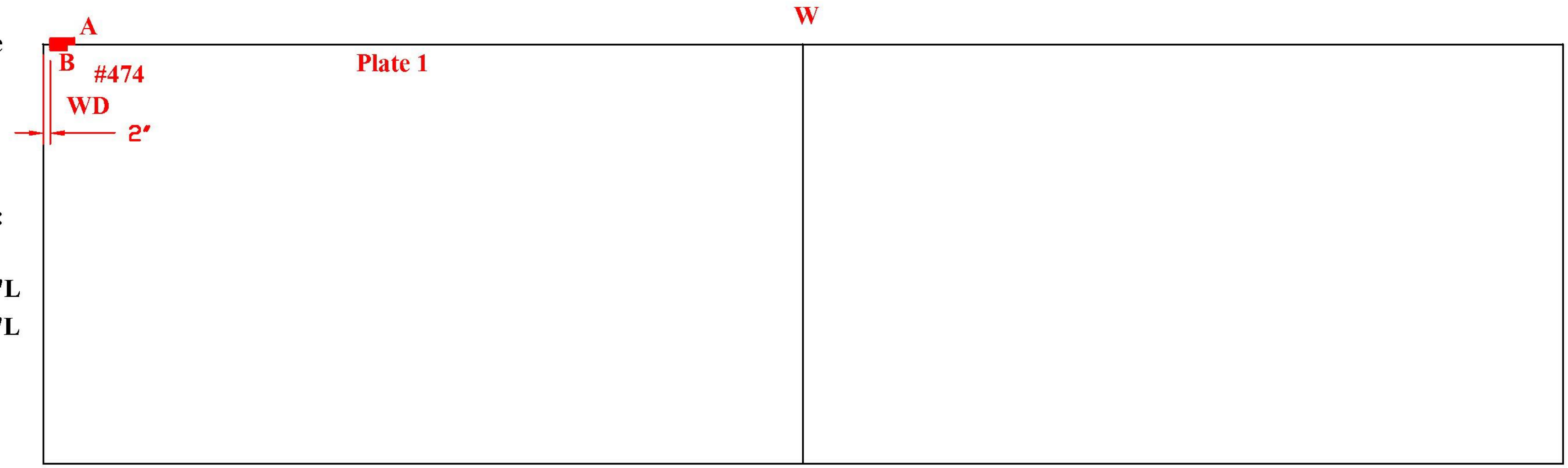
TANK # 20 - QUADRANT A
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 1

Flaw # - Type - Remaining:

#474: A) LOF - 0.091"D 7"L
B) LOF - 0.103"D 5"L

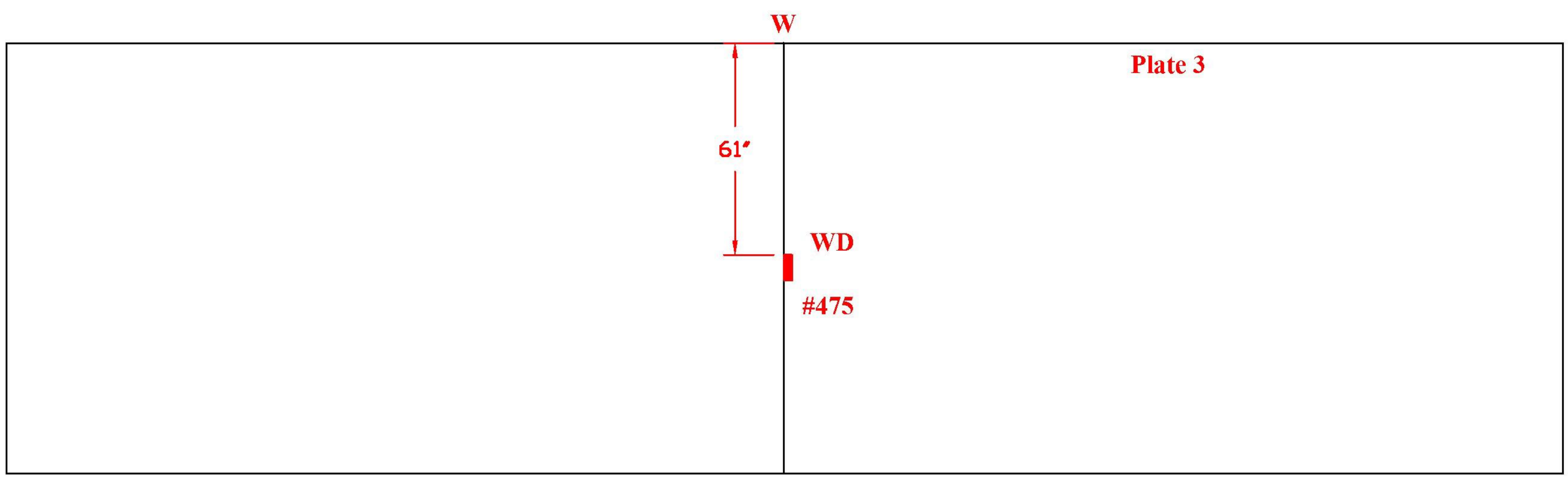


Tank Section: Upper Dome
Quadrant: A

Course: C
Plate #: 3

Flaw # - Type - Remaining:

#475: A) LOF - 0.138"D 3"L



Drawing is not to scale

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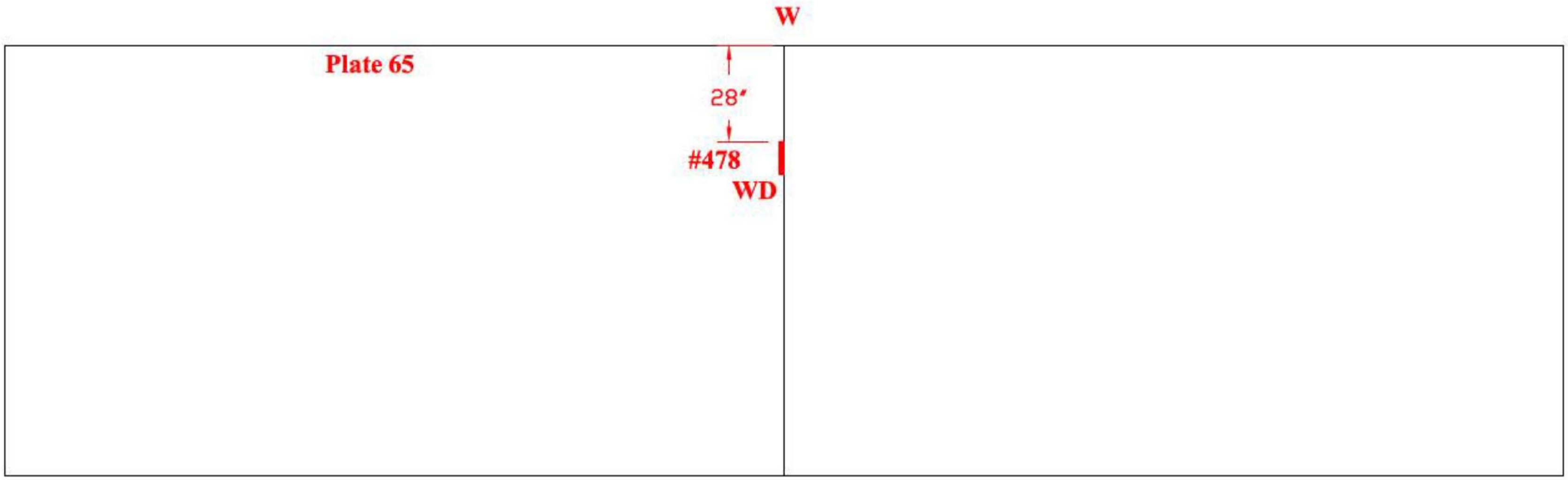
TANK # 20 - QUADRANT D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 65

Flaw # - Type - Remaining:

#478 - LOF/Porosity
- 0.179"D 8"L

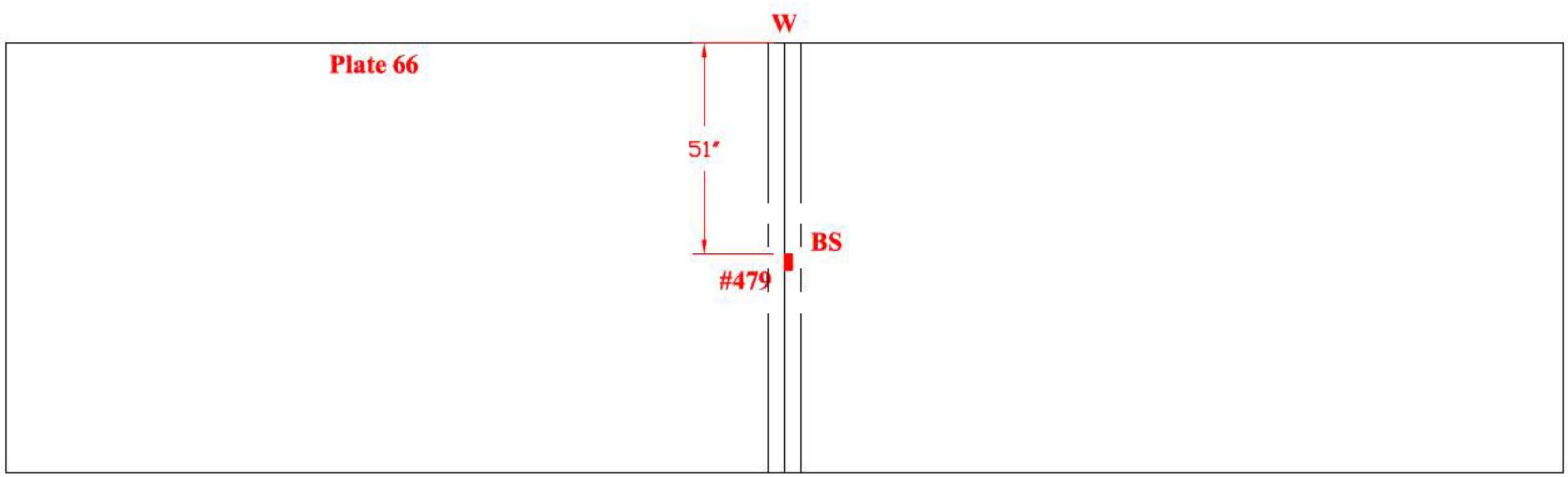


Tank Section: Upper Dome
Quadrant: D

Course: A
Plate #: 66

Flaw # - Type - Remaining:

#479 - Gouge(BS)
- 0.085"D 0.500"L



Drawing is not to scale

TesTex
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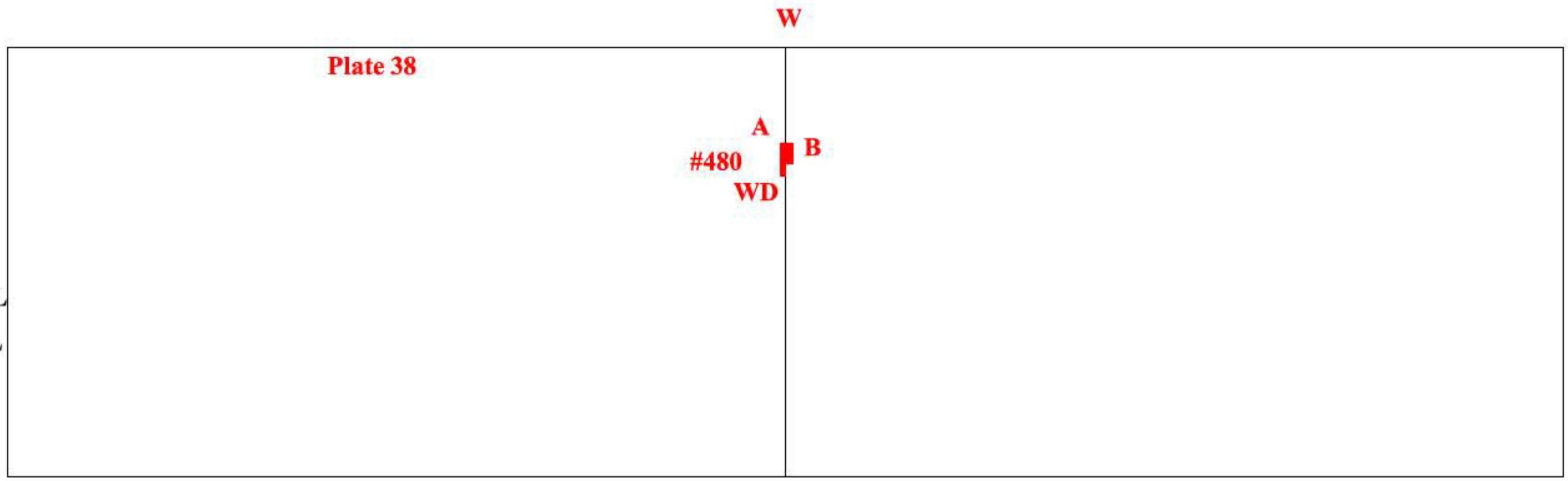
TANK # 20 - QUADRANT B AND D
Nominal Plate Thickness: 0.250"

Tank Section: Upper Dome
Quadrant: D

Course: C
Plate #: 38

Flaw # - Type - Remaining:

#480: A)LOF/Pit - 0.107"D 2"L
B)LOF/Pit - 0.212"D 1"L

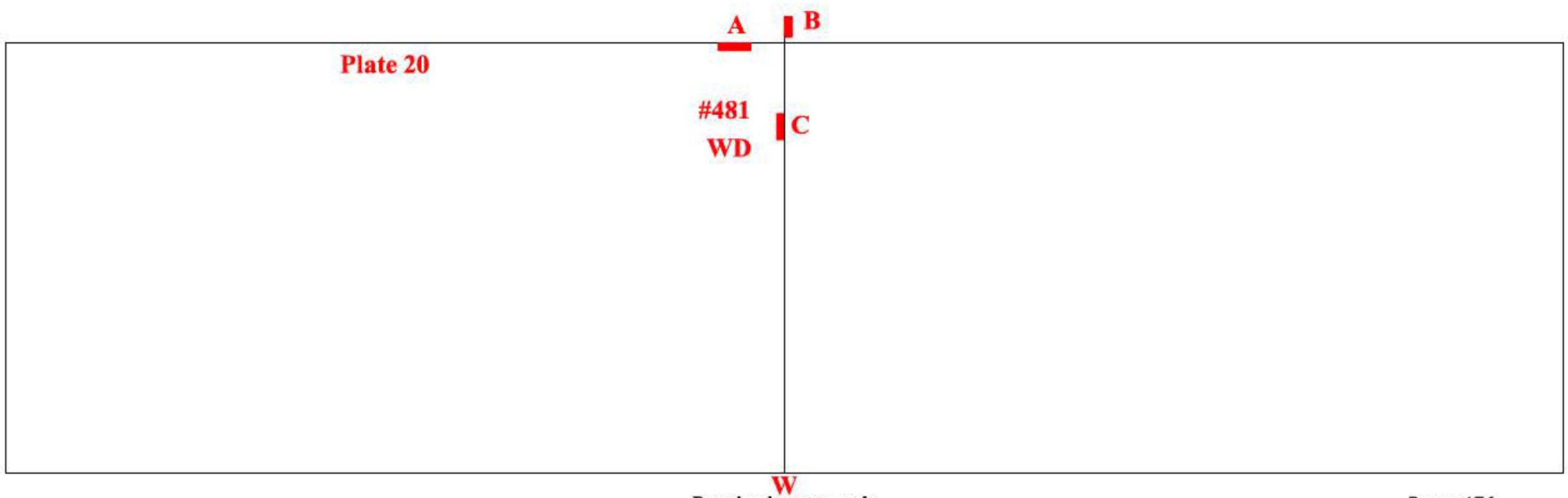


Tank Section: Upper Dome
Quadrant: B

Course: C
Plate #: 20

Flaw # - Type - Remaining:

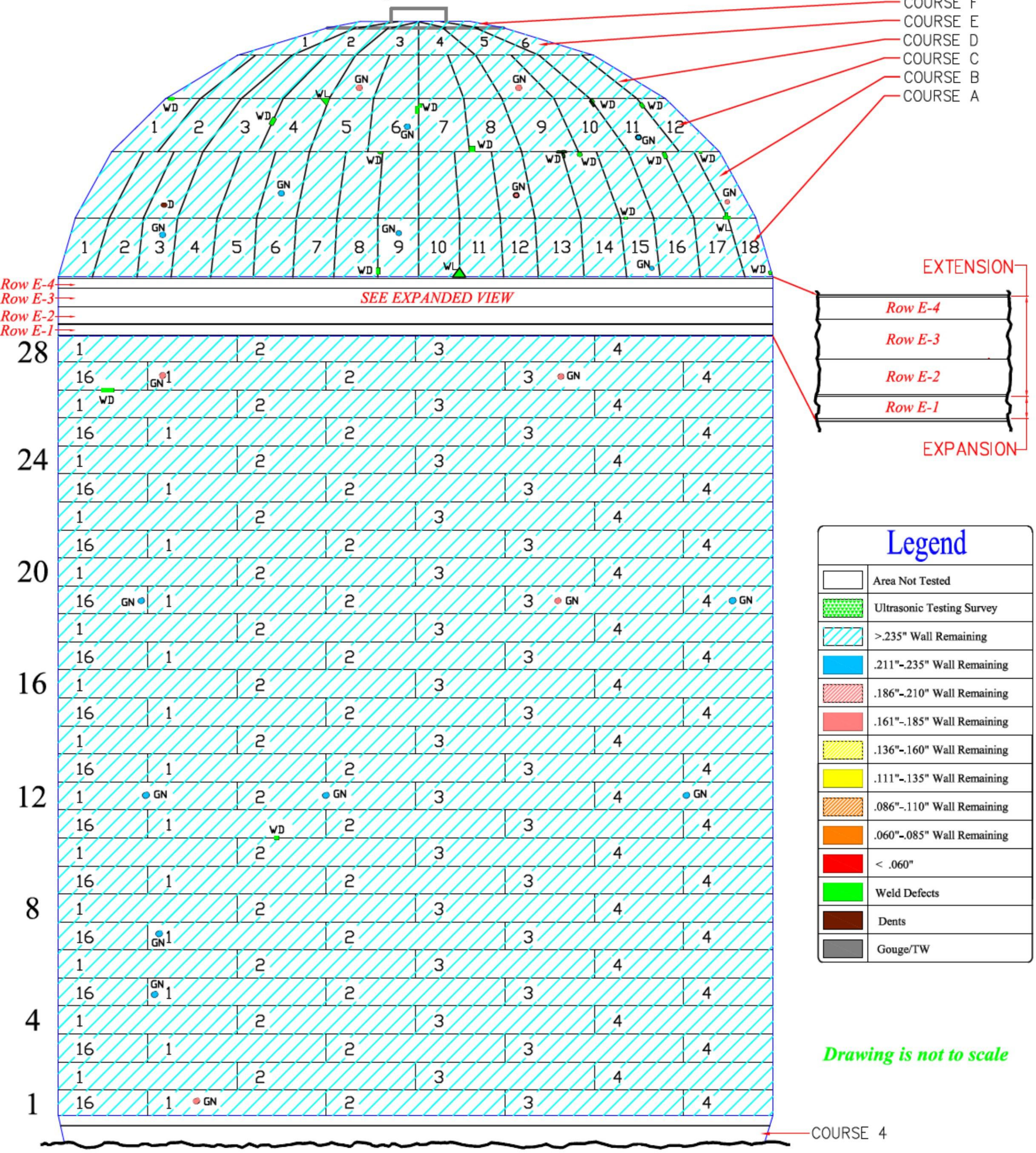
#481: A) LOF - 0.112"D 5"L
B) LOF - 0.202"D 3"L
C) LOF - 0.087"D 6"L



Drawing is not to scale

TesTex

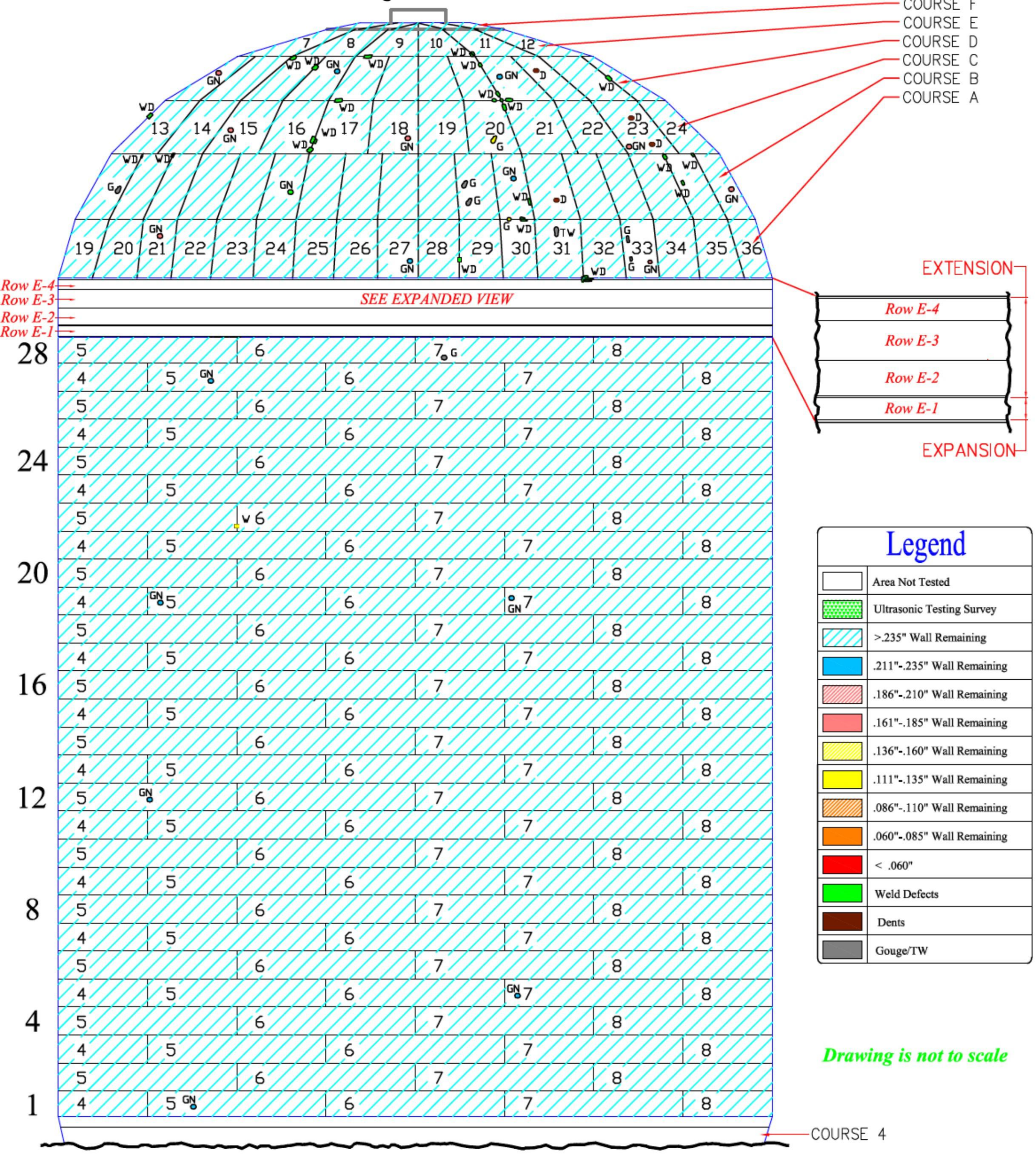
TANK # 20 - QUADRANT A - SECTION



Legend	
	Area Not Tested
	Ultrasonic Testing Survey
	>.235" Wall Remaining
	.211"-.235" Wall Remaining
	.186"-.210" Wall Remaining
	.161"-.185" Wall Remaining
	.136"-.160" Wall Remaining
	.111"-.135" Wall Remaining
	.086"-.110" Wall Remaining
	.060"-.085" Wall Remaining
	< .060"
	Weld Defects
	Dents
	Gouge/TW

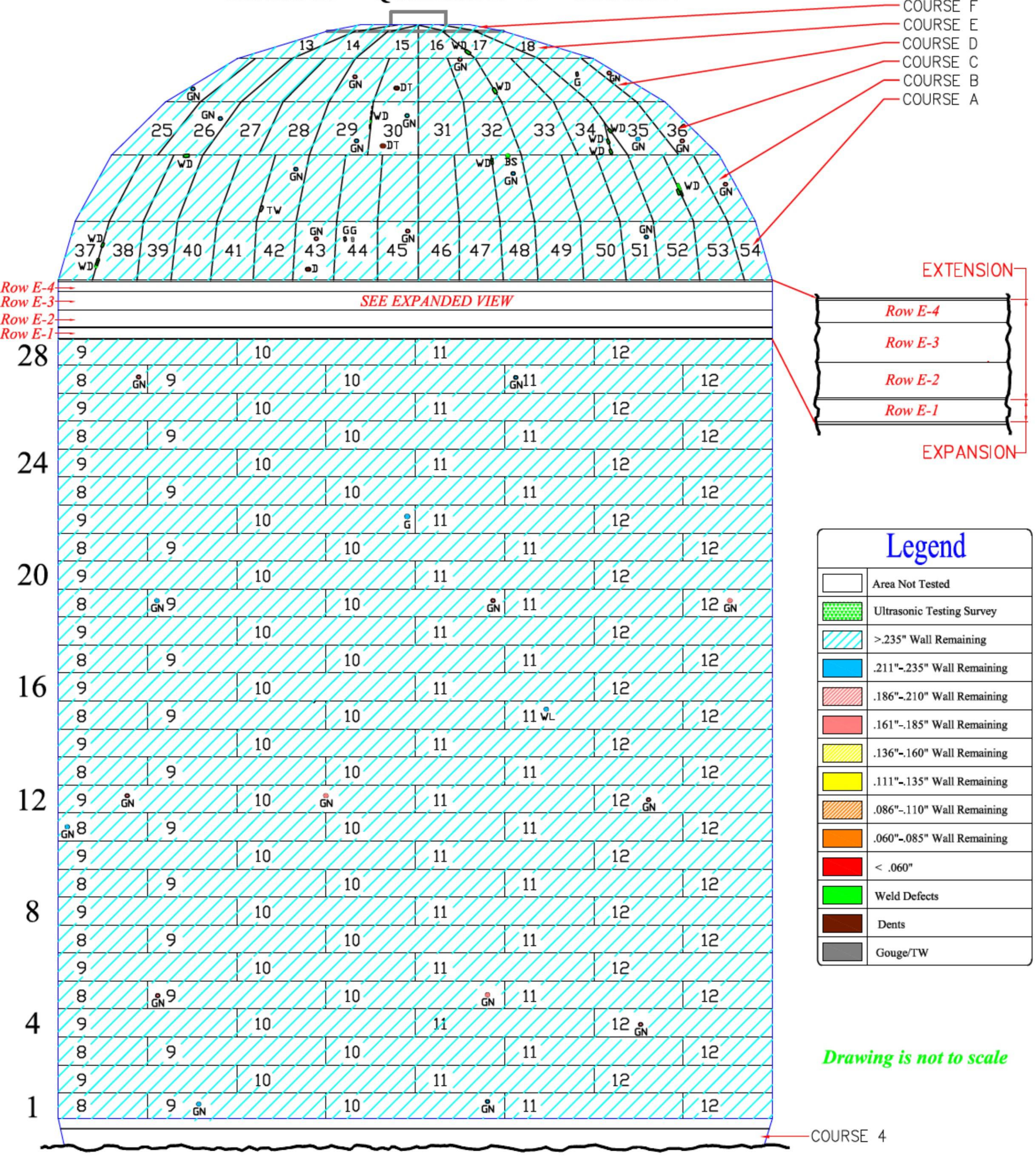
Drawing is not to scale

TANK # 20 - QUADRANT B - SECTION



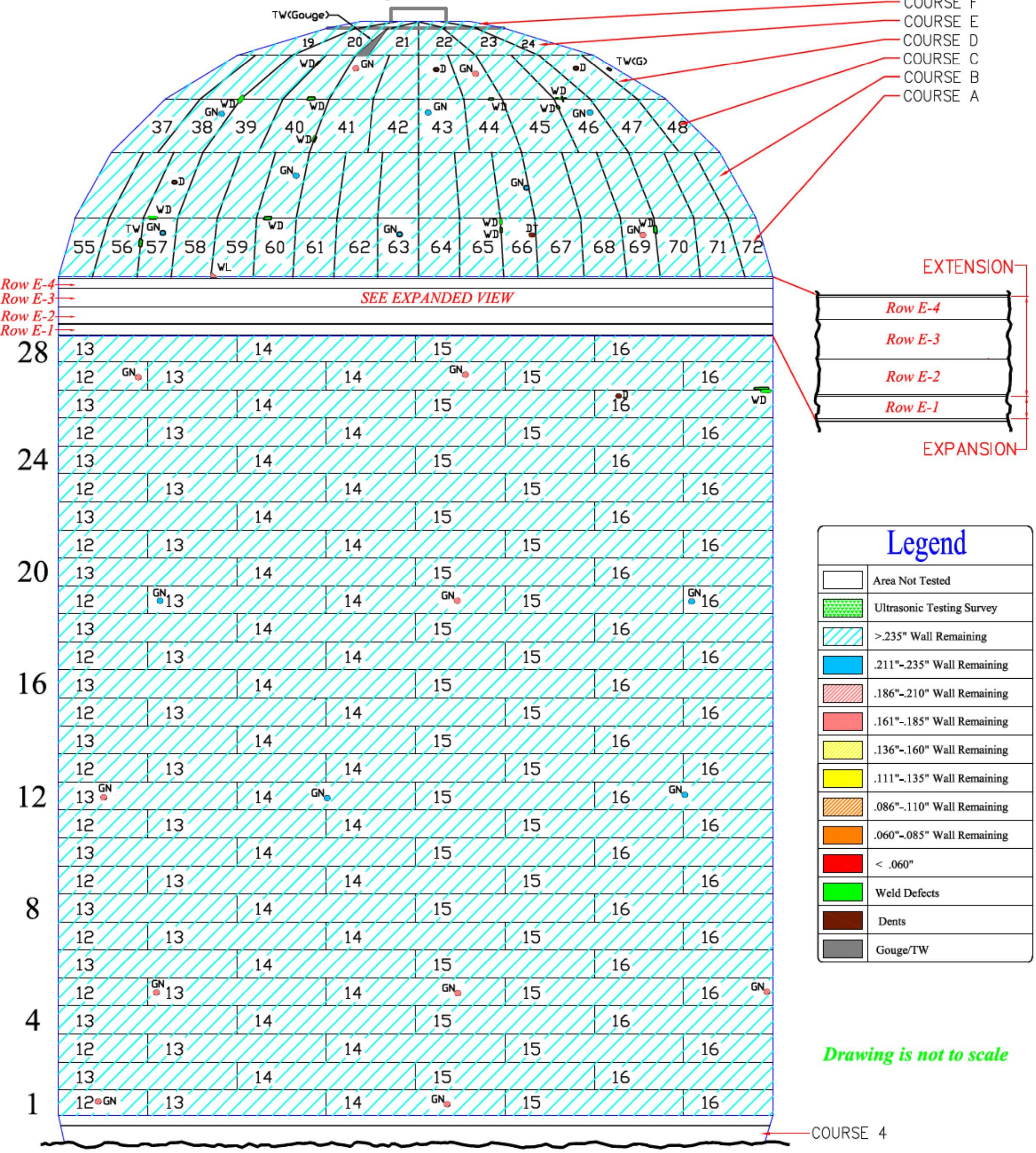
TesTex

TANK # 20 - QUADRANT C - SECTION



TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

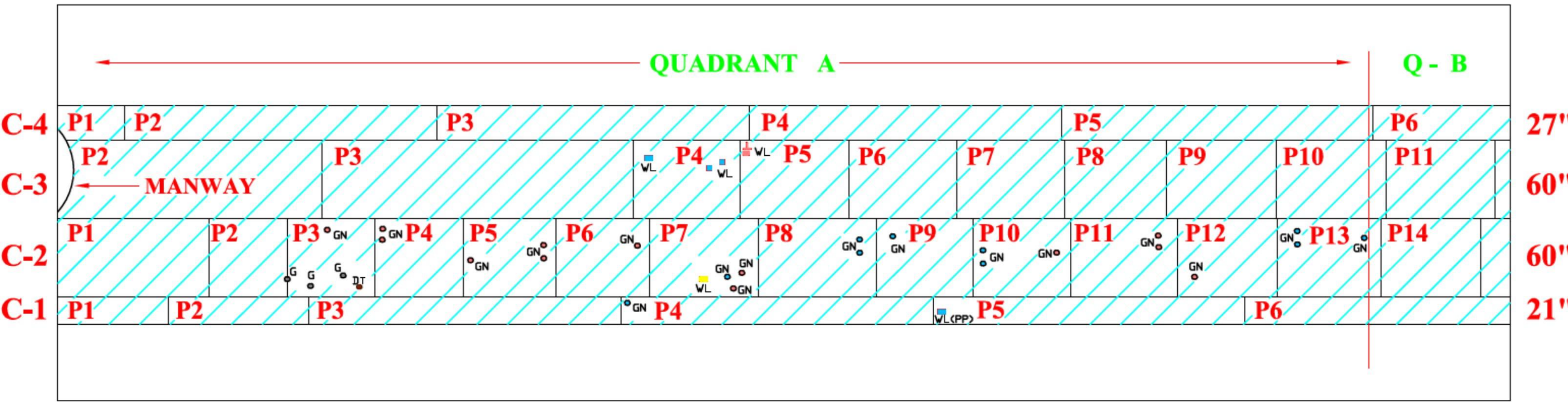
TANK # 20 - QUADRANT D - SECTION



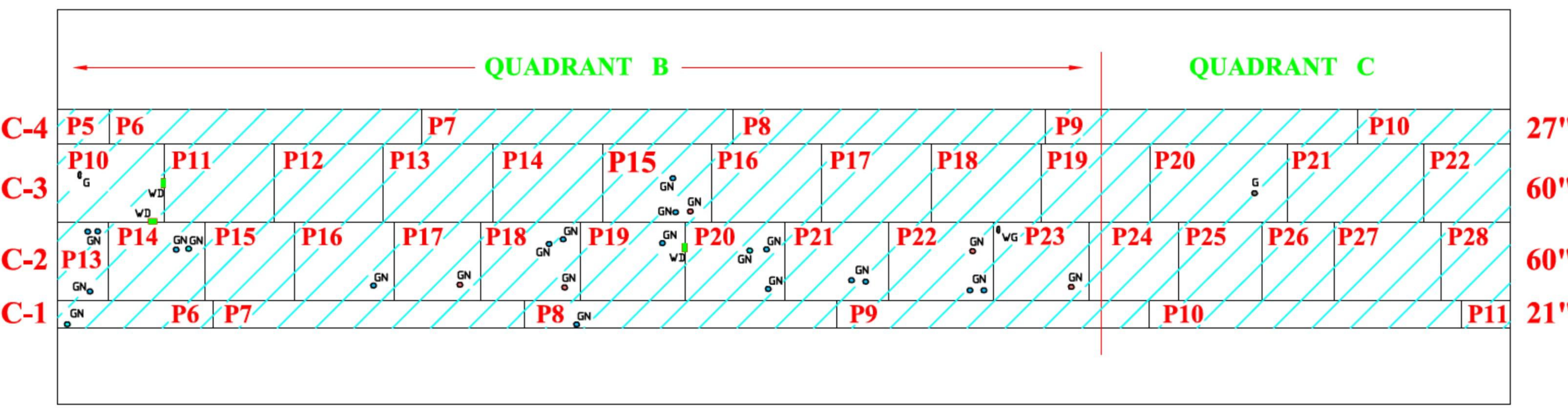
TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

TANK # 20 - QUADRANT A AND B EXTENSION

Nominal Plate Thickness: 0.250"



Legend										
		Area Not Tested		.211"-.235" Wall Remaining		.136"-.160" Wall Remaining		< .060" Wall Remaining		Gouge/TW
		Ultrasonic Testing Survey		.186"-.210" Wall Remaining		.086"-.110" Wall Remaining		Weld Defects		
		>.235" Wall Remaining		.161"-.185" Wall Remaining		.060"-.085" Wall Remaining		Dents		



Drawing is not to scale

TANK MAPS
Dunkin & Bush, Inc.
Honolulu, HI

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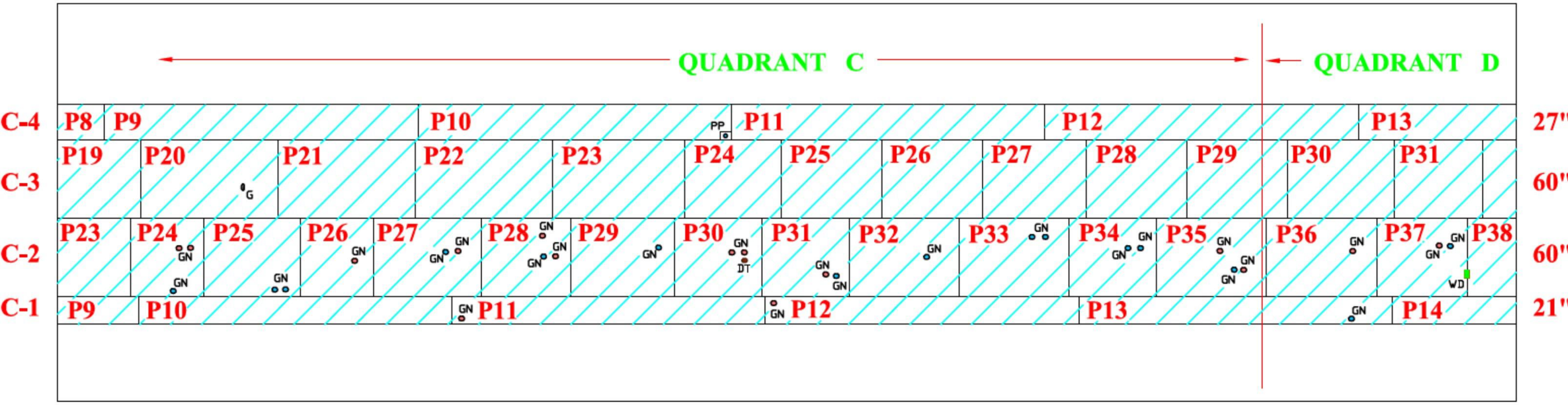
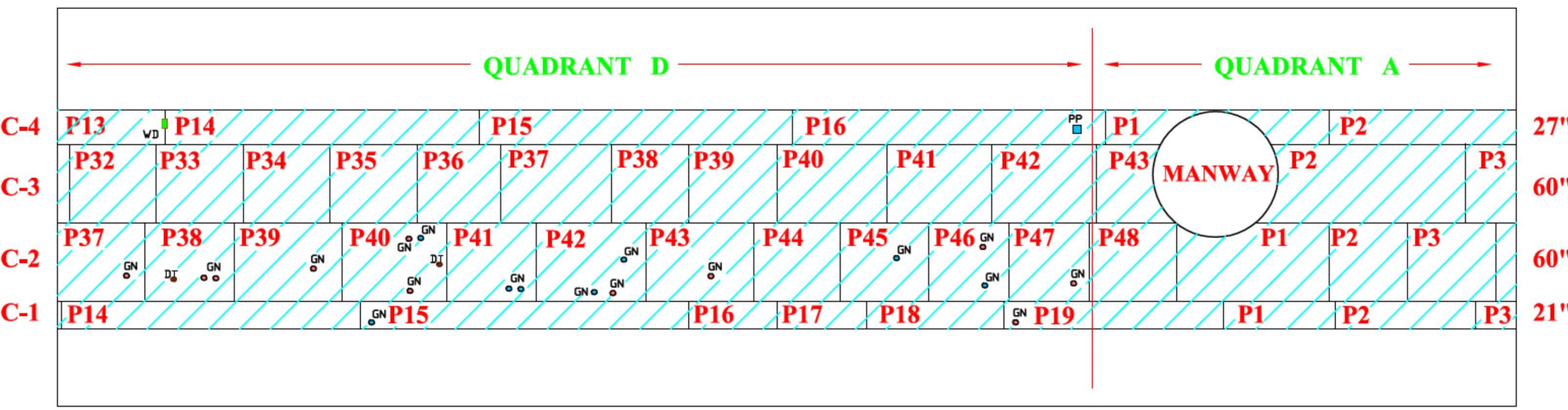
TANK # 20 - QUADRANT C AND D EXTENSION

Nominal Plate Thickness: 0.250"

Date Inspected/Confirmed:



Legend										
		Area Not Tested		.211"-.235" Wall Remaining		.136"-.160" Wall Remaining		< .060" Wall Remaining		Gouge/TW
		Ultrasonic Testing Survey		.186"-.210" Wall Remaining		.086"-.110" Wall Remaining		Weld Defects		
		>.235" Wall Remaining		.161"-.185" Wall Remaining		.060"-.085" Wall Remaining		Dents		



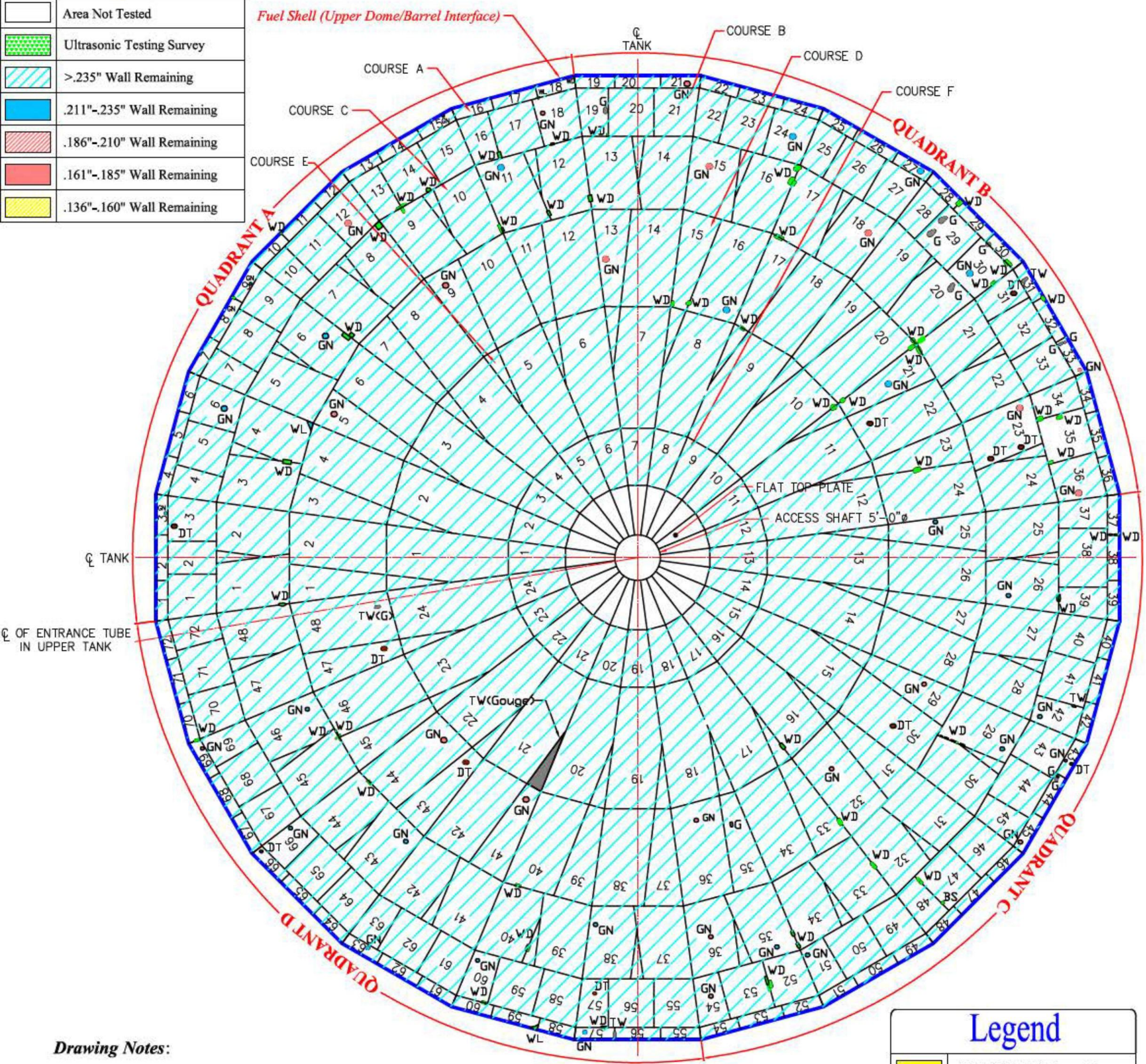
Drawing is not to scale

TesTex

Legend

(white)	Area Not Tested
(green dotted)	Ultrasonic Testing Survey
(cyan hatched)	>.235" Wall Remaining
(blue)	.211"-.235" Wall Remaining
(pink hatched)	.186"-.210" Wall Remaining
(salmon)	.161"-.185" Wall Remaining
(yellow hatched)	.136"-.160" Wall Remaining

TANK # 20 - UPPER DOME LINER PLATES



Legend

(yellow)	.111"-.135" Wall Remaining
(orange hatched)	.086"-.110" Wall Remaining
(orange)	.060"-.085" Wall Remaining
(red)	< .060"
(green)	Weld Defects
(brown)	Dents
(gray)	Gouge/TW

Drawing Notes:

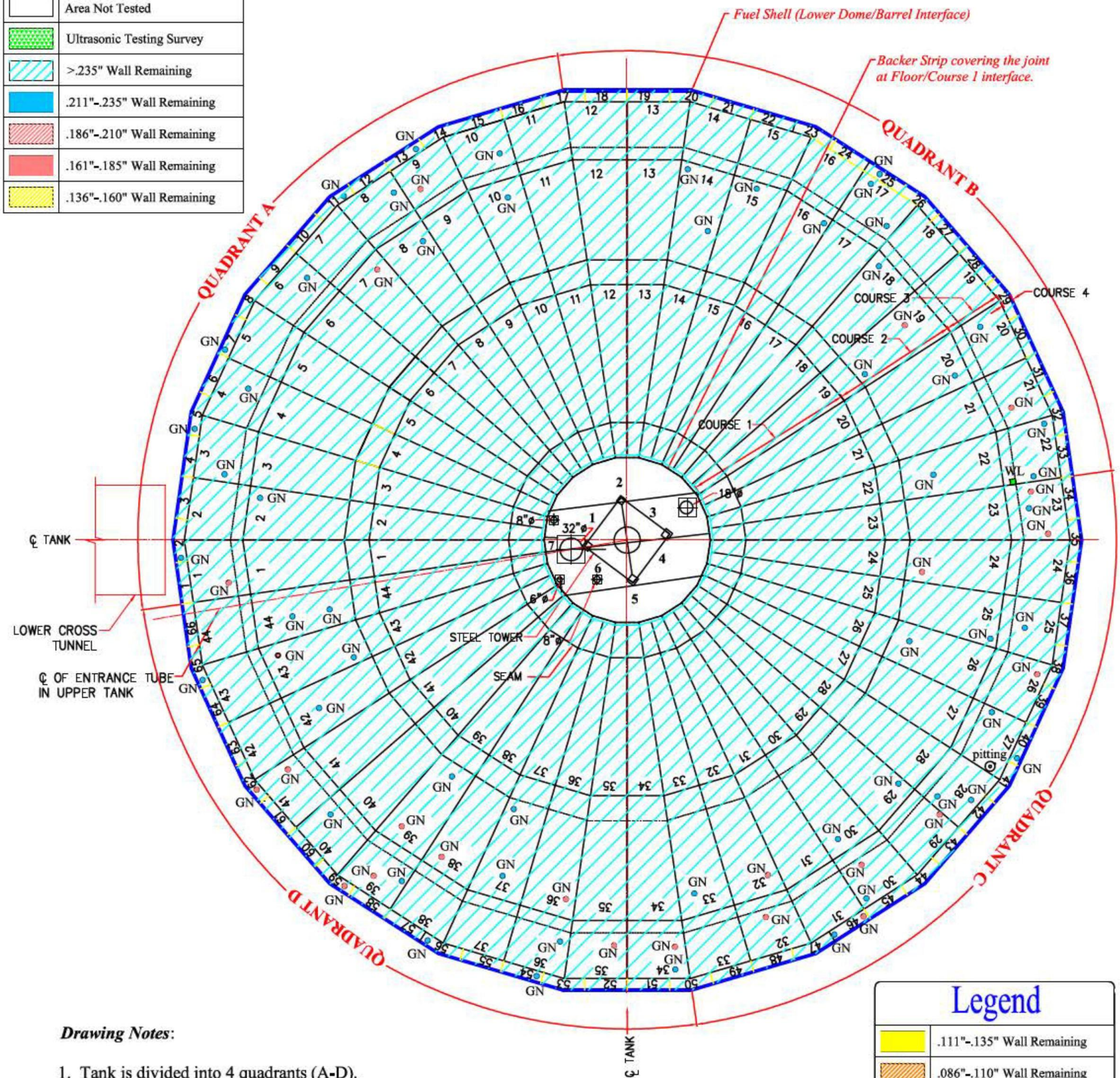
1. Tank is divided into 4 quadrants (A-D).
2. Course A is comprised of 72 total plates.
3. Quadrant A is comprised of 18 plates (1-18).
4. Quadrant B is comprised of 18 plates (19-36).
5. Quadrant C is comprised of 18 plates (37-54).
6. Quadrant D is comprised of 18 plates (55-72).
7. This numbering convention begins with plate #1 being the first full plate to the left of the manway in plan view.

Drawing is not to scale

TANK # 20 - LOWER DOME LINER PLATES

Legend

	Area Not Tested
	Ultrasonic Testing Survey
	>.235" Wall Remaining
	.211"-.235" Wall Remaining
	.186"-.210" Wall Remaining
	.161"-.185" Wall Remaining
	.136"-.160" Wall Remaining



Legend

	.111"-.135" Wall Remaining
	.086"-.110" Wall Remaining
	.060"-.085" Wall Remaining
	< .060"
	Weld Defects
	Dents
	Gouge/TW

Drawing Notes:

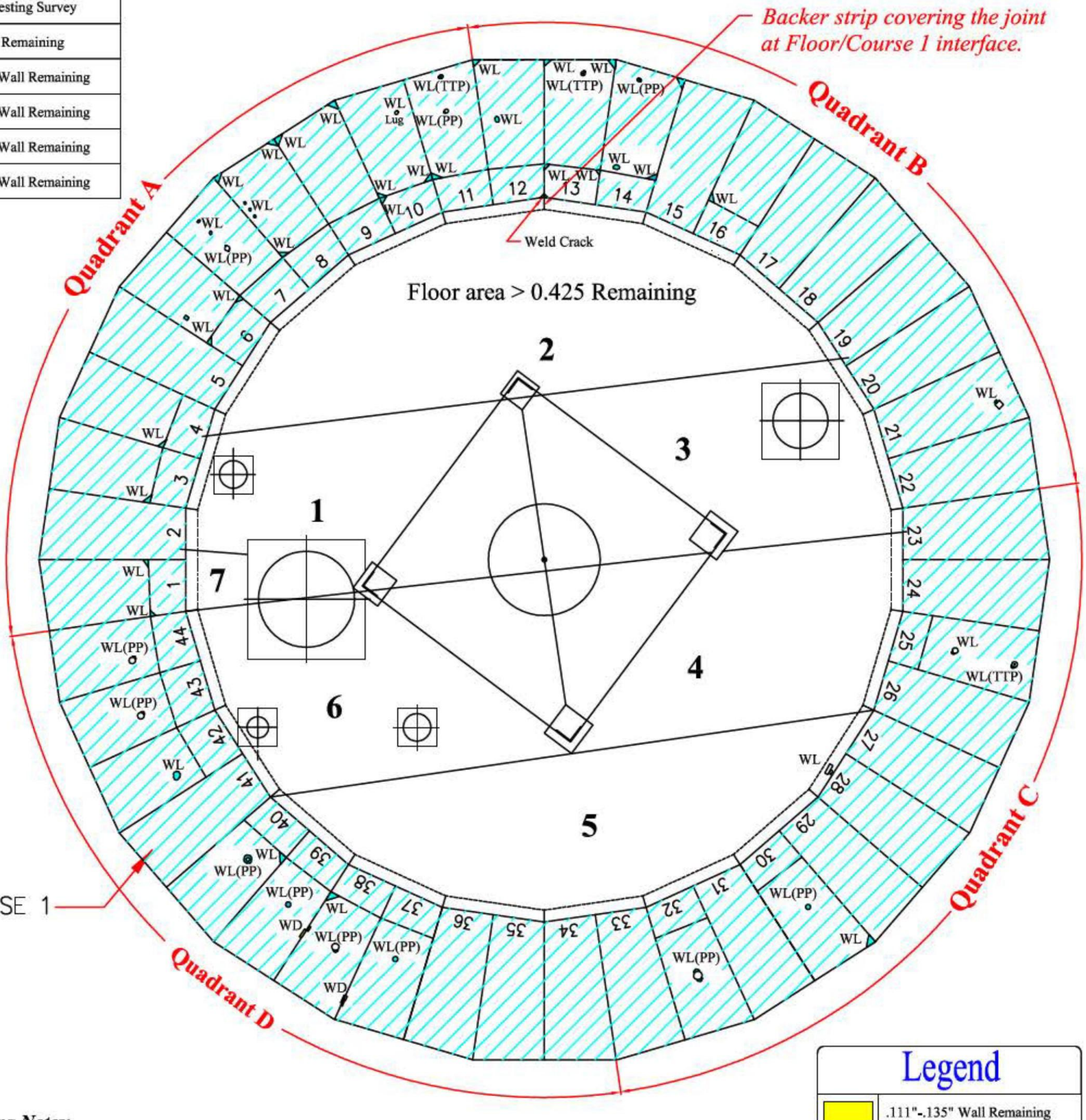
1. Tank is divided into 4 quadrants (A-D).
2. The floor plates are 0.500" NWT & all other plates are 0.250" NWT.
3. Course 1 is comprised of 44 total plates.
4. Quadrant A is comprised of 11 plates (1-11).
5. Quadrant B is comprised of 11 plates (12-22).
6. Quadrant C is comprised of 11 plates (23-33).
7. Quadrant D is comprised of 11 plates (34-44).
8. This numbering convention begins with plate #1 being the first plate of quadrant A.

Drawing is not to scale

TesTex

Legend	
	Area Not Tested
	Ultrasonic Testing Survey
	>.235" Wall Remaining
	.211"-.235" Wall Remaining
	.186"-.210" Wall Remaining
	.161"-.185" Wall Remaining
	.136"-.160" Wall Remaining

TANK # 20 - LOWER DOME



Legend	
	.111"-.135" Wall Remaining
	.086"-.110" Wall Remaining
	.060"-.085" Wall Remaining
	< .060"
	Weld Defects
	Dents
	Gouge/TW

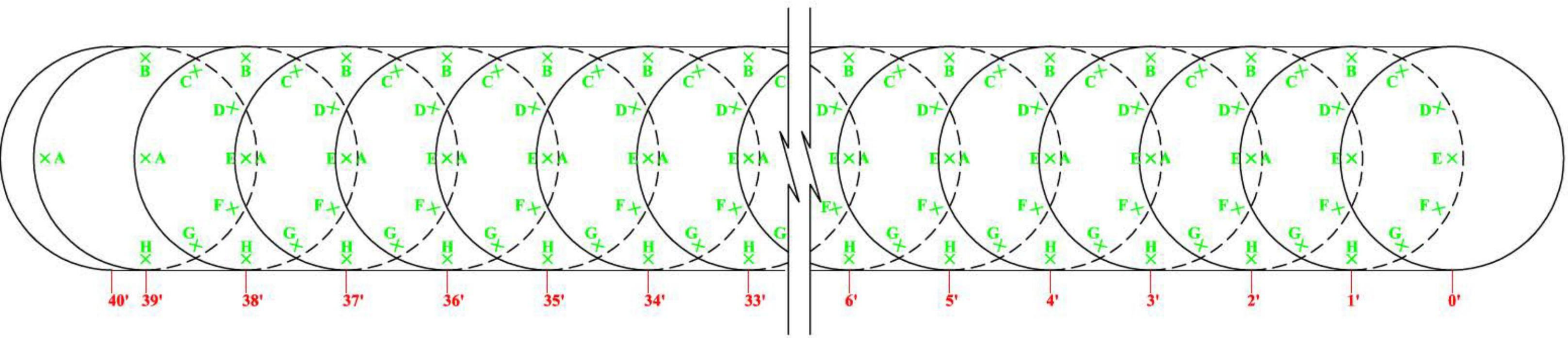
Drawing Notes:

1. Tank is divided into 4 quadrants (A-D).
2. Course 1 is comprised of 44 total plates.
3. Quadrant A is comprised of 11 plates (1-11).
4. Quadrant B is comprised of 11 plates (12-22).
5. Quadrant C is comprised of 11 plates (23-33).
6. Quadrant D is comprised of 11 plates (34-44).
7. This numbering convention begins with plate #1 being the first plate of quadrant A.

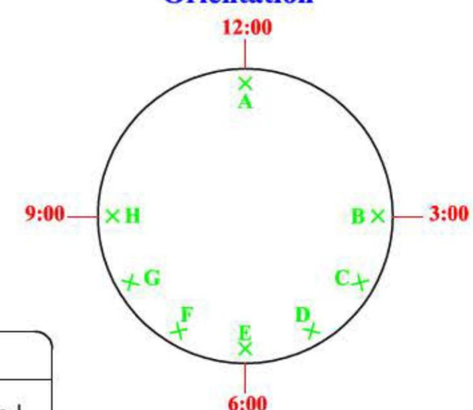
Drawing is not to scale

TANK MAPS
Dunkin and Bush, Inc.
Honolulu, HI
Tank #20 - 32" Fuel Pipe
Ultrasonic Testing Survey

TANK #20 - 32" FUEL PIPE (U.T. Survey)



Orientation



LEGEND
× Ultrasonic Testing Survey Point

Drawing is not to scale

TANK MAPS
Dunkin and Bush, Inc.
Honolulu, HI
Tank #20 - 32" Fuel Pipe
Ultrasonic Testing Survey

	A	B	C	D	E	F	G	H
1'	0.371"	0.377"	0.370"	0.380"	0.370"	0.373"	0.370"	0.370"
2'	0.374"	0.375"	0.370"	0.373"	0.372"	0.373"	0.373"	0.375"
3'	0.375"	0.377"	0.368"	0.377"	0.375"	0.281"	0.369"	0.373"
4'	0.372"	0.371"	0.377"	0.373"	0.369"	0.377"	0.393"	0.375"
5'	0.377"	0.417"	0.372"	0.392"	0.378"	0.363"	0.404"	0.385"
6'	0.430"	0.436"	0.416"{	0.388"	0.419"	0.428"	0.428"	0.415"
7'	0.431"	0.427"	0.428"	0.430"	0.429"	0.431"	0.425"	0.432"
8'	0.429"	0.431"	0.405"	0.425"	0.435"	0.427"	0.426"	0.428"
9'	0.446"	0.452"	0.458"	0.439"	0.448"	0.447"	0.414"	0.418"
10'	0.452"	0.428"	0.459"	0.440"	0.426"	0.416"	0.455"	0.443"
11'	0.420"	0.453"	0.417"	0.424"	0.448"	0.427"	0.449"	0.445"
12'	0.434"	0.419"	0.430"	0.422"	0.425"	0.451"	0.447"	0.431"
13'	0.421"	0.426"	0.445"	0.428"	0.451"	0.418"	0.423"	0.447"
14'	0.423"	0.426"	0.442"	0.411"	0.428"	0.430"	0.422"	0.440"
15'	0.425"	0.414"	0.442"	0.428"	0.438"	0.421"	0.419"	0.428"
16'	0.427"	0.421"	0.449"	0.413"	0.425"	0.452"	0.422"	0.449"
17'	0.431"	0.426"	0.437"	0.444"	0.428"	0.421"	0.448"	0.443"
18'	0.422"	0.423"	0.428"	0.445"	0.442"	0.420"	0.445"	0.436"
19'	0.444"	0.443"	0.419"	0.442"	0.420"	0.418"	0.442"	0.423"
20'	0.432"	0.430"	0.441"	0.447"	0.436"	0.435"	0.446"	0.452"
21'	0.434"	0.421"	0.420"	0.434"	0.416"	0.423"	0.445"	0.438"
22'	0.419"	0.424"	0.414"	0.436"	0.427"	0.430"	0.425"	0.417"
23'	0.426"	0.425"	0.421"	0.445"	0.420"	0.448"	0.423"	0.421"
24'	0.423"	0.419"	0.421"	0.428"	0.438"	0.419"	0.418"	0.423"
25'	0.387"	0.394"	0.402"	0.429"	0.402"	0.389"	0.380"	0.440"
26'	0.410"	0.409"	0.401"	0.441"	0.398"	0.389"	0.383"	0.433"
27'	0.390"	0.400"	0.423"	0.428"	0.390"	0.378"	0.416"	0.424"
28'	0.398"	0.400"	0.401"	0.426"	0.398"	0.399"	0.430"	0.425"
29'	0.390"	0.403"	0.422"	0.442"	0.430"	0.398"	0.390"	0.390"
30'	0.386"	0.400"	0.403"	0.450"	0.406"	0.397"	0.400"	0.385"
31'	0.383"	0.395"	0.396"	0.439"	0.411"	0.394"	0.380"	0.390"
32'	0.391"	0.398"	0.403"	0.400"	0.389"	0.385"	0.424"	0.400"
33'	0.387"	0.400"	0.403"	0.441"	0.406"	0.386"	0.378"	0.425"
34'	0.410"	0.399"	0.405"	0.427"	0.430"	0.414"	0.383"	0.420"
35'	0.399"	0.386"	0.395"	0.412"	0.388"	0.404"	0.390"	0.405"
36'	0.385"	0.416"	0.391"	0.400"	0.398"	0.385"	0.408"	0.404"
37'	0.381"	0.415"	0.414"	0.428"	0.398"	0.397"	0.393"	0.400"
38'	0.381"	0.383"	0.402"	0.428"	0.399"	0.418"	0.395"	0.395"
39'	0.388"	0.384"	0.408"	0.396"	0.407"	0.393"	0.435"	0.430"
40'	0.377"	0.386"	0.423"	0.408"	0.416"	0.399"	0.392"	0.395"
41'	0.386"	0.383"	0.418"	0.394"	0.422"	0.428"	0.422"	0.393"
42'	0.421"	0.408"	0.429"	0.401"	0.416"	0.409"	0.411"	0.416"
43'	0.416"	0.402"	0.399"	0.378"	0.427"	0.416"	0.417"	0.415"
44'	0.424"	0.409"	0.408"	0.390"	0.397"	0.435"	0.418"	0.421"
45'	0.416"	0.408"	0.425"	0.405"	0.402"	0.430"	0.407"	0.411"
46'	0.387"	0.389"	0.392"	0.423"	0.391"	0.409"	0.383"	0.373"
47'	0.379"	0.394"	0.395"	0.387"	0.391"	0.385"	0.383"	0.375"
48'	0.386"	0.389"	0.387"	0.385"	0.414"	0.381"	0.380"	0.411"
49'	0.418"	0.406"	0.395"	0.385"	0.389"	0.383"	0.381"	0.393"

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
1	Lower Dome	A	1	1	Wall Loss (corner)	0.236
2	Lower Dome	A	1	1	Wall Loss (corner)	0.24
3	Lower Dome	A	1	3	Wall Loss (corner)	0.24
4	Lower Dome	A	1	4	Wall Loss (corner)	0.24
5	Lower Dome	A	1	6	Wall Loss (corner)	0.24
6	Lower Dome	A	1	6	Wall Loss (corner)	0.24
7	Lower Dome	A	1	6	Wall Loss	0.24
8	Lower Dome	A	1	7	Wall Loss (around PP)	0.24
9	Lower Dome	A	1	7	Wall Loss	0.24
10	Lower Dome	A	1	7	Wall Loss	0.241
11	Lower Dome	A	1	8	Wall Loss (corner)	0.24
12	Lower Dome	A	1	8	Wall Loss	0.239
13	Lower Dome	A	1	8	Wall Loss	0.241
14	Lower Dome	A	1	8	Wall Loss	0.242
15	Lower Dome	A	1	8	Wall Loss (corner)	0.24
16	Lower Dome	A	1	8	Wall Loss (corner)	0.237
17	Lower Dome	A	1	9	Wall Loss (corner)	.237/0.240
18	Lower Dome	A	1	10	Wall Loss (corner)	0.238
19	Lower Dome	A	1	10	Wall Loss (corner)	0.24
20	Lower Dome	A	1	10	Wall Loss (corner)	0.24
21	Lower Dome	A	1	10	Wall Loss (around Lug)	0.235
22	Lower Dome	A	1	11	Wall Loss (corner)	0.24
23	Lower Dome	A	1	11	Wall Loss (around PP)	0.237
24	Lower Dome	A	1	11	Wall Loss (around pipe plate)	0.237
25	Lower Dome	B	1	12	Wall Loss	0.242
26	Lower Dome	B	1	12	Wall Loss (corner)	0.237
27	Lower Dome	B	1	13	Wall Loss (corner)	0.234
28	Lower Dome	B	1	13	Wall Loss (corner)	0.228
29	Lower Dome	B	1	13	Wall Loss (corner)	0.24
30	Lower Dome	B	1	13	Wall Loss (around pipe plate)	0.24
31	Lower Dome	B	1	13	Wall Loss (corner)	0.24
32	Lower Dome	B	1	13	Wall Loss (corner)	0.239
33	Lower Dome	B	1	14	Wall Loss	0.24
34	Lower Dome	B	1	14	Wall Loss (corner)	0.235
35	Lower Dome	B	1	14	Wall Loss (around PP)	0.239
36	Lower Dome	B	1	14	Wall Loss (around pipe plate)	0.24
37	Lower Dome	B	1	14	Wall loss (corner)	0.24
38	Lower Dome	B	1	16	Wall Loss (corner)	0.24
39	Lower Dome	B	1	21	Wall Loss (around diamond pl.)	0.244
40	Lower Dome	C	1	25	Wall Loss (around PP)	0.243
41	Lower Dome	C	1	25	Wall Loss (around pipe plate)	0.241
42	Lower Dome	C	1	28	Wall Loss (around bracket)	0.238
43	Lower Dome	C	1	30	Wall loss (PP)	0.238
44	Lower Dome	C	1	30	Wall Loss (corner)	0.239
45	Lower Dome	C	1	32	Wall Loss (around PP)	.237-.240
46	Lower Dome	D	1	37	Wall loss (PP)	0.24
47	Lower Dome	D	1	37-38	LOF, LOF, LOF	.120, .189, .125
48	Lower Dome	D	1	38	Wall Loss (corner)	0.24

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
49	Lower Dome	D	1	38	Wall Loss (around PP)	0.237
50	Lower Dome	D	1	38-39	LOF	0.089
51	Lower Dome	D	1	38-39	LOF	0.118
52	Lower Dome	D	1	39	Wall loss (PP)	0.23
53	Lower Dome	D	1	40	Wall Loss (corner)	0.24
54	Lower Dome	D	1	40	Wall Loss (around PP)	.238-.240
55	Lower Dome	D	1	42	Wall Loss	0.24
56	Lower Dome	D	1	43	Wall Loss (around PP)	0.24
57	Lower Dome	D	1	44	Wall Loss (around PP)	0.24
58	Lower Dome	D	2	43	Grout Nozzle	0.21
59	Lower Dome	D	2	42	Grout Nozzle	0.23
60	Lower Dome	D	2	41	Grout Nozzle	0.198
61	Lower Dome	D	2	39	Grout Nozzle	.208/. 218
62	Lower Dome	D	2	38	Grout Nozzle	0.208
63	Lower Dome	D	2	37	Grout Nozzle	0.228
64	Lower Dome	D	2	36	Grout Nozzle	0.209
65	Lower Dome	C	2	33	Grout Nozzle	0.22
66	Lower Dome	C	2	32	Grout Nozzle	0.207
67	Lower Dome	C	2	30	Grout Nozzle	0.22
68	Lower Dome	C	2	29	Grout Nozzle	0.212
69	Lower Dome	A	2	7	Grout Nozzle	0.2
70	Lower Dome	A	2	8	Grout Nozzle	0.22
71	Lower Dome	B	2	14	Grout Nozzle	0.212
72	Lower Dome	B	2	15	Grout Nozzle	0.22
73	Lower Dome	B	2	16	Grout Nozzle	0.215
74	Lower Dome	B	2	18	Grout Nozzle	0.211
75	Lower Dome	B	2	19	Grout Nozzle	0.208
76	Lower Dome	B	2	19	Grout Nozzle	0.224
77	Lower Dome	B	3	22	Grout Nozzle	0.23
78	Lower Dome	B	3	22	Grout Nozzle	0.23
79	Lower Dome	B	3	20	Grout Nozzle	0.224
80	Lower Dome	B	3	17	Grout Nozzle	0.212
81	Lower Dome	B	3	17	Grout Nozzle	0.22
82	Lower Dome	B	4	25	Grout Nozzle	0.225
83	Lower Dome	A	2	10	Grout Nozzle	0.236
84	Lower Dome	B	2	20	Grout Nozzle	0.21
85	Lower Dome	C	3	32	Grout Nozzle	0.207
86	Lower Dome	C	3	31	Grout Nozzle	0.199
87	Lower Dome	C	3	26	Grout Nozzle	0.216
88	Lower Dome	C	3	25	Grout Nozzle	0.211
89	Lower Dome	C	3	23	Grout Nozzle	.207/. 217
90	Lower Dome	C	2	23	Grout Nozzle	0.219
91	Lower Dome	C	2	24	Grout Nozzle	0.21
92	Lower Dome	C	2	25	Grout Nozzle	0.213
93	Lower Dome	C	3	28	Grout Nozzle	0.216
94	Lower Dome	C	3	26	Grout Nozzle	0.187
95	Lower Dome	B	4	31	Grout Nozzle	0.215
96	Lower Dome	B	3	22	Grout Nozzle	0.23

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
97	Lower Dome	B	3	14	Grout Nozzle	0.22
98	Lower Dome	A	3	10	Grout Nozzle	0.219
99	Lower Dome	A	3	9	Grout Nozzle	0.198
100	Lower Dome	A	4	13	Grout Nozzle	0.219
101	Lower Dome	A	4	11	Grout Nozzle	0.222
102	Lower Dome	A	3	6	Grout Nozzle	0.223
104	Lower Dome	A	3	8	Grout Nozzle	0.23
105	Lower Dome	A	3	6	Grout Nozzle	0.213
106	Lower Dome	A	3	5	Grout Nozzle	0.222
107	Lower Dome	A	4	7	Grout Nozzle	0.214
108	Lower Dome	A	3	4	Grout Nozzle	0.215
109	Lower Dome	A	3	3	Grout Nozzle	0.224
110	Lower Dome	A	4	5	Grout Nozzle	0.22
111	Lower Dome	D	4	65	Grout Nozzle	0.228
112	Lower Dome	C	4	46	Grout Nozzle	0.201
113	Lower Dome	B	3	22	WL	0.232
114	Lower Dome	C	4	40	Grout Nozzle	0.212
115	Lower Dome	C	3	30	Grout Nozzles	0.228/. 207
116	Lower Dome	C	3	29	Grout Nozzle	0.21
117	Lower Dome	C	3	28	Grout Nozzle	0.216
118	Lower Dome	C	3	27	Pitting	0.233
119	Lower Dome	C	3	27	Grout Nozzle	0.205
120	Lower Dome	D	4	48	Grout Nozzle	0.211
121	Lower Dome	D	3	34	Grout Nozzle	0.2
122	Lower Dome	D	3	34	Grout Nozzle	0.215
123	Lower Dome	D	3	35	Grout Nozzle	0.2
124	Lower Dome	D	3	36	Grout Nozzle	0.219
125	Lower Dome	D	4	54	Grout Nozzle	0.212
126	Lower Dome	D	3	37	Grout Nozzle	0.213
126	Lower Dome	D	3	37	Grout Nozzle	0.213
127	Lower Dome	D	3	39	Grout Nozzle	0.204
128	Lower Dome	D	3	39	Grout Nozzle	0.212
129	Lower Dome	D	4	56	Grout Nozzle	0.213
130	Lower Dome	D	4	59	Grout Nozzle	0.207
131	Lower Dome	D	3	40	Grout Nozzle	0.212
132	Lower Dome	D	4	62	Grout Nozzle	0.205
133	Lower Dome	D	3	41	Grout Nozzle	0.21
134	Lower Dome	D	3	43	Grout Nozzle	0.224
135	Lower Dome	D	3	44	Grout Nozzle	0.228
136	Lower Dome	D	3	44	Grout Nozzle	0.224
137	Barrel	D	26	16	Dent	0.1
138	Barrel	D	5	16	Grout Nozzle	0.196
139	Barrel	D	19	16	Grout Nozzle	0.218
140	Barrel	A	12	2	Grout Nozzle	0.219
141	Barrel	A	19	3	Grout Nozzle	0.204
142	Barrel	D	12	14	Grout Nozzle	0.226
143	Barrel	A	27	3	Grout Nozzle	0.202

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
144	Barrel	D	1	14	Grout Nozzle	0.208
145	Barrel	D	5	14	Grout Nozzle	0.204
146	Barrel	A	11	1	LOF	0.157
147	Barrel	A	12	1	Grout Nozzle	0.23
148	Barrel	D	19	14	Grout Nozzle	0.21
149	Barrel	D	27	14	Grout Nozzle	0.207
150	Barrel	D	12	13	Grout Nozzle	0.202
151	Barrel	D	19	13a	Grout Nozzle	0.212
152	Barrel	A	19	4	Grout Nozzle	0.23
153	Barrel	A	C	4b	Grout Nozzle	0.224
154	Barrel	C	1	12	Grout Nozzle	0.204
155	Barrel	D	5	13	Grout Nozzle	0.207
156	Barrel	C	12	12	Grout Nozzle	0.21
157	Barrel	D	27	12	Grout Nozzle	0.204
158	Barrel	D	4	12	Grout Nozzle	0.197
159	Barrel	C	19	12	Grout Nozzle	0.197
160	Barrel	B	27	5	Grout Nozzle	0.221
161	Barrel	B	12	5	Grout Nozzle	0.221
162	Barrel	C	1	10	Grout Nozzle	0.212
163	Barrel	C	5	10	Grout Nozzle	0.204
164	Barrel	C	12	10	Grout Nozzle	0.207
165	Barrel	C	15	11	Low Spot	0.231
166	Barrel	C	23	10	Gouge	0.107 Deep
167	Barrel	C	19	10	Grout Nozzle	0.204
168	Barrel	A	12	4	Grout Nozzle	0.213
169	Barrel	A	1	5	Grout Nozzle	0.219
170	Barrel	A	19	5	Grout Nozzle	0.224
171	Barrel	A	17	4	NRI	N/A
172	Barrel	B	19	7	Grout Nozzle	0.229
173	Barrel	B	28	7	Gouge	0.140 Deep
174	Barrel	B	22	6	LOF, LOF	.113, .121
175	Barrel	B	5	7	Grout Nozzle	0.23
176	Barrel	C	27	11	Grout Nozzle	0.214
177	Barrel	C	12	9	Grout Nozzle	0.204
178	Barrel	C	1	9	Grout Nozzle	0.211
179	Barrel	C	5	9	Grout Nozzle	0.209
180	Barrel	B	27	8	Grout Nozzle	0.203
181	Barrel	C	12	8	Grout Nozzle	0.222
182	Barrel	C	19	9A	Grout Nozzle	0.213
180	Barrel	B	27	8	Grout Nozzle	0.203
181	Barrel	C	12	8	Grout Nozzle	0.222
182	Barrel	C	19	9A	Grout Nozzle	0.213
184	Extension	C	2	24	Grout Nozzle	0.207
185	Extension	C	2	24	Grout Nozzle	0.208
186	Extension	C	2	24	Grout Nozzle	0.22
187	Extension	C	2	25	Grout Nozzle	0.227
188	Extension	C	2	25	Grout Nozzle	0.223
189	Extension	C	2	26	Grout Nozzle	0.2

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
190	Extension	C	2	27	Grout Nozzle	0.208
191	Extension	C	2	27	Grout Nozzle	0.217
192	Extension	C	2	28	Grout Nozzle	0.199
193	Extension	C	2	28	Grout Nozzle	0.2
194	Extension	C	2	28	Grout Nozzle	0.217
195	Extension	C	2	29	Grout Nozzle	0.21
196	Extension	C	2	30	Grout Nozzle	0.2
197	Extension	C	2	30	Grout Nozzle	0.192
198	Extension	C	2	30	Dent	0.200 Deep
199	Extension	C	2	31	Grout Nozzle	0.219
200	Extension	C	2	31	Grout Nozzle	0.204
201	Extension	C	2	32	Grout Nozzle	0.211
202	Extension	C	2	33	Grout Nozzle	0.211
203	Extension	C	2	33	Grout Nozzle	0.211
204	Extension	C	2	34	Grout Nozzle	0.214
205	Extension	C	2	34	Grout Nozzle	0.21
206	Extension	C	2	35	Grout Nozzle	0.195
207	Extension	C	2	35	Grout Nozzle	0.205
208	Extension	C	2	35	Grout Nozzle	0.213
209	Extension	D	2	36	Grout Nozzle	0.193
210	Extension	D	2	37	Grout Nozzle	0.213
211	Extension	D	2	37	Grout Nozzle	0.2
212	Extension	D	2	37	LOF	0.098
213	Exp Joint	B	1	11	Grout Nozzle	0.205
214	Exp Joint	C	1	12	Grout Nozzle	0.207
215	Extension	C	3	20	Gouge	.160 deep
216	Extension	C	4	10	Patch Plate	0.23
217	Barrel	B	5	8	Grout Nozzle	0.194
218	Barrel	B	19	8	Grout Nozzle	0.23
219	Barrel	B	27	8	LOF, LOF	.131, .137
220	Barrel	B	27	8	General Corrosion	0.23
221	Extension	A	2	3	Gouge	0.21
222	Exp Joint	A	1	4	Grout Nozzle	0.23
223	Exp Joint	A	1	5	Square Plate	0.23
224	Exp Joint	B	1	6	Grout Nozzle	0.236
225	Exp Joint	B	1	8	Grout Nozzle	0.232
226	Extension	B	2	23	Grout Nozzle	0.208
227	Extension	B	2	23	WG	0.127
228	Extension	B	2	22	Grout Nozzle	0.209
229	Extension	B	2	22	Grout Nozzle	0.229
230	Extension	B	2	23	Grout Nozzle	0.236
231	Extension	B	2	21	Grout Nozzle	0.226
232	Extension	B	2	21	Grout Nozzle	0.219
233	Extension	B	2	20	Grout Nozzle	0.224
234	Extension	B	2	20	Grout Nozzle	0.24
235	Extension	B	2	20	Grout Nozzle	0.219
236	Extension	B	2	18	Grout Nozzle	0.209
237	Extension	B	2	19	Grout Nozzle	0.212

4.0 PLATE TEST SUMMARY
Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
238	Exp Joint	D	1	19	Grout Nozzle	0.205
239	Exp Joint	C	1	13	Grout Nozzle	0.211
240	Exp Joint	D	1	15	Grout Nozzle	0.221
241	Extension	D	4	16	Patch Plate	0.225
242	Extension	D	2	47	Grout Nozzle	0.2
243	Extension	D	2	45	Grout Nozzle	0.211
244	Extension	D	2	46	Grout Nozzle	0.202
245	Extension	D	2	46	Grout Nozzle	0.211
246	Extension	D	2	43	Grout Nozzle	0.197
247	Extension	D	2	44	NRI	N/A
248	Extension	D	3	35	NRI	N/A
249	Extension	D	2	42	Grout Nozzle	0.212
250	Extension	D	2	42	Grout Nozzle	0.209
251	Extension	D	2	42	Grout Nozzle	0.215
252	Extension	D	2	40	Grout Nozzle	0.214
253	Extension	D	2	40	Grout Nozzle	0.21
254	Extension	D	2	40	Grout Nozzle	0.203
255	Extension	D	2	40	Dent	0.200 Deep
256	Extension	D	2	41	Grout Nozzle	0.212
257	Extension	D	2	41	Grout Nozzle	0.214
258	Extension	D	4	13	LOF	0.147
259	Extension	D	2	39	Grout Nozzle	0.2
260	Extension	D	2	37	Grout Nozzle	0.203
261	Extension	D	2	38	Grout Nozzle	0.209
262	Extension	D	2	38	Grout Nozzle	0.205
263	Extension	D	2	38	Dent	0.200 Deep
264	Upper Dome	D	A	54	Dent	0.200 Deep
265	Upper Dome	D	A	66	Dent	0.205 Deep
266	Upper Dome	D	A	56	TW (LOF), TW (LOF)	.092, .092
267	Extension	B	2	19	WP	.156 Deep
268	Extension	B	2	16	NRI	N/A
269	Extension	B	2	16	Grout Nozzle	0.212
270	Extension	B	2	17	Grout Nozzle	0.217
271	Extension	B	2	17	Grout Nozzle	0.215
272	Extension	B	2	17	Grout Nozzle	0.196
273	Extension	B	2	15	Grout Nozzle	0.217
274	Extension	B	2	15	Grout Nozzle	0.21
275	Extension	B	2	15	Grout Nozzle	0.219
276	Extension	B	3	10	Gouge	0.21
277	Extension	B	3	10	LOF, LOF	.152, .094
278	Extension	B	3	10	LOF, LOF	.206, .230
279	Extension	B	2	14	Grout Nozzle	0.237
280	Extension	B	2	14	Grout Nozzle	0.235
281	Extension	A	2	4	Grout Nozzle	0.208
282	Extension	A	2	4	Grout Nozzle	0.206
283	Extension	A	2	5	Grout Nozzle	0.195
284	Extension	A	2	5	Grout Nozzle	0.194
285	Extension	A	2	5	Grout Nozzle	0.208

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
286	Extension	A	2	6	Grout Nozzle	0.198
287	Extension	A	2	8	Grout Nozzle	0.216
288	Extension	A	2	8	Grout Nozzle	0.215
289	Extension	A	2	10	Grout Nozzle	0.224
290	Extension	A	2	10	Grout Nozzle	0.228
291	Extension	A	2	10	Grout Nozzle	0.208
292	Extension	A	2	12	Grout Nozzle	0.21
293	Extension	A	2	7	Grout Nozzle	0.202
294	Extension	A	2	7	Grout Nozzle	0.219
295	Extension	A	2	7	Grout Nozzle	0.194
296	Extension	A	2	9	Grout Nozzle	0.218
297	Extension	A	2	11	Grout Nozzle	0.197
298	Extension	A	2	11	Grout Nozzle	0.208
299	Extension	B	2	13	Grout Nozzle	0.222
300	Extension	B	2	13	Grout Nozzle	0.219
301	Extension	B	2	13	Grout Nozzle	0.215
302	Upper Dome	D	A	57	LOF/Pit, LOF	.234, .144
303	Upper Dome	D	A	60	LOF	0.081
304	Upper Dome	D	A	59	WL	0.165
305	Upper Dome	D	A	69	LOF	0.127
306	Upper Dome	D	A	69	Grout Nozzle	0.2
307	Upper Dome	D	A	69	NRI	N/A
308	Upper Dome	D	A	57	Grout Nozzle	0.211
309	Upper Dome	D	A	63	Grout Nozzle	0.213
310	Upper Dome	C	A	45	Grout Nozzle	0.203
311	Upper Dome	C	A	51	Grout Nozzle	0.225
312	Upper Dome	C	A	37	LOF	0.115
313	Upper Dome	C	A	37	WP, LOF, WP, LOF	.213, .109, .194, .071
314	Upper Dome	C	A	44	LOF (BM), LOF (BM)	.100, .126
315	Upper Dome	C	A	43	Dent	.200 Deep
316	Upper Dome	A	A	39	Grout Nozzle	0.2
317	Upper Dome	A	A	39	Dent	.200 Deep
318	Upper Dome	A	A	15	Grout Nozzle	0.23
319	Upper Dome	A	A	21	Grout Nozzle	0.206
320	Upper Dome	A	A	8	NRI	N/A
321	Upper Dome	A	A	9	Grout Nozzle	0.217
322	Extension	A	3	4	Underside corrosion	0.22
323	Extension	A	3	4	Underside corrosion	0.22
324	Extension	A	3	4	Underside corrosion	0.235
325	Upper Dome	A	A	P10	Patch Plate	0.137
326	Upper Dome	A	A	P11	Patch Plate	0.198
327	Extension	A	2	3	Grout Nozzle	0.201
328	Extension	A	2	3	Dent	.160 deep
329	Extension	A	2	3	Arc Gouge	0.160 Deep
330	Extension	A	2	3	Arc Gouge	0.160 Deep
331	Extension	B	2	13	Grout Nozzle	0.222
332	Extension	B	2	13	Grout Nozzle	0.219
333	Extension	B	2	13	Grout Nozzle	0.215

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
334	Extension	A	2	7	Underside corrosion	0.137
335	Extension	A	3	5	Underside corrosion	0.208
336	Upper Dome	C	B	36	Grout Nozzle	0.197
337	Upper Dome	C	B	42	TW (LOF)	0.14
338	Upper Dome	D	B	66	Grout Nozzle	0.217
339	Upper Dome	D	B	60	Grout Nozzle	0.218
340	Upper Dome	D	B	57	Dent	.200 Deep
341	Upper Dome	D	B	53	LOF, LOF, LOF	.083, .217, .064
342	Upper Dome	D	B	54	Grout Nozzle	0.206
343	Upper Dome	C	B	48	Grout Nozzle	0.212
344	Upper Dome	C	B	42	Grout Nozzle	0.212
345	Upper Dome	C	B	39	LOF	0.169
346	Upper Dome	C	B	47	LOF, LOF	.188, .221
347	Upper Dome	C	B	48	Hole (BS)	.244 Deep
348	Upper Dome	C	B	51	NRI	N/A
349	Upper Dome	B	B	31	Dent	.160 Deep
350	Upper Dome	B	B	24	Grout Nozzle	0.221
351	Upper Dome	B	B	29	Arc Gouge	0.160 Deep
352	Upper Dome	B	B	29	Arc Gouge	0.160 Deep
353	Upper Dome	B	B	19	Arc Gouge	0.160 Deep
354	Upper Dome	B	B	22	Pit (NRI)	N/A
355	Upper Dome	A	B	6	Grout Nozzle	0.214
356	Upper Dome	A	B	12	Grout Nozzle	0.21
357	Upper Dome	A	A	15	WP	0.062
359	Upper Dome	B	A	32	LOF, LOF, LOF, LOF, LOF	.206, .104, .214, .111, .110
360	Upper Dome	B	A	18	LOF	0.217
361	Upper Dome	B	A	33	Grout Nozzle	0.209
362	Upper Dome	B	A	33	TW (LOF)	0.134
363	Upper Dome	B	A	33	TW (LOF)	0.169
364	Upper Dome	B	B	30	LOF	0.117
365	Upper Dome	B	B	30	LOF	0.093
366	Upper Dome	B	B	30	LOF	0.115
367	Upper Dome	B	B	30	Gouge BS)	0.137
368	Upper Dome	B	B	30	Grout Nozzle	0.217
369	Upper Dome	B	A	29	WP (limited scan-interference)	.125 dia
370	Upper Dome	B	A	31	NRI	N/A
371	Extension	A	2	7	Grout Nozzle	0.202
372	Extension	A	2	7	Grout Nozzle	0.194
373	Extension	A	2	7	Grout Nozzle	0.219
374	Upper Dome	B	A	27	Grout Nozzle	0.214
375	Upper Dome	B	B	35	TW (LOF)	0.143
376	Upper Dome	A	C	4	Underside corrosion	0.23
377	Upper Dome	A	B	8	LOF	0.053
378	Upper Dome	A	C	8	LOF	0.132
379	Upper Dome	A	B	14	LOF, LOF, LOF	.156, .133, .205
380	Upper Dome	A	B	17	LOF	0.109
381	Upper Dome	A	B	18	WP (NRI)	.063 dia
382	Upper Dome	B	C	17	LOF, LOF	0.116, .073

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
383	Upper Dome	B	C	17	LOF, LOF	.225, .223
384	Upper Dome	B	B	35	LOF	0.097
385	Upper Dome	B	B	35	LOF/Pit	0.106
386	Upper Dome	B	C	23	Grout Nozzle	0.18
387	Upper Dome	B	C	23	Dent	.250 deep
388	Upper Dome	B	C	23	Dent	.100 deep
389	Upper Dome	B	C	20	Gouge (BM)	.137 Deep
390	Upper Dome	B	C	18	Grout Nozzle	0.208
391	Upper Dome	A	C	11	Grout Nozzle	0.22
392	Upper Dome	A	B	14	LOF	0.207
393	Upper Dome	A	B	17	LOF	0.127
394	Upper Dome	D	C	46	LOF, LOF, LOF, LOF, WP, LOF	.090, .150, .097, .199, .125, .115
395	Upper Dome	D	C	46	LOF	0.23
396	Upper Dome	D	C	46	Grout Nozzle	0.212
397	Upper Dome	D	C	44	LOF	0.091
398	Upper Dome	D	C	38	Grout Nozzle	0.22
399	Upper Dome	D	C	43	Grout Nozzle	0.22
400	Upper Dome	D	C	43	NRI	N/A
401	Upper Dome	C	C	33	LOF	0.2
402	Upper Dome	D	C	35	Grout Nozzle	0.229
403	Upper Dome	C	C	30	Dent	.180 deep
404	Upper Dome	C	C	30	Grout Nozzle	0.218
405	Upper Dome	C	C	26	Grout Nozzle	0.218
406	Upper Dome	D	C	40	LOF/Pit	0.06
407	Upper Dome	C	C	34	LOF	0.1
408	Upper Dome	C	C	34	LOF, LOF	.131, .111
409	Upper Dome	A	C	13	LOF	0.089
410	Upper Dome	B	C	15	Grout Nozzle	0.19
411	Upper Dome	B	B	18	Grout Nozzle	0.21
412	Upper Dome	A	C	6	Grout Nozzle	0.225
413	Upper Dome	A	C	11	LOF, LOF	.229, .149
414	Upper Dome	A	C	6	LOF, LOF	.212, .229
415	Upper Dome	B	C	21	Gouge (BS),Pit (BS)	.132, .107
416	Upper Dome	A	C	12	WP	0.089
417	Upper Dome	C	C	29	LOF, G, LOF, LOF, LOF, G	.091, .115, .05, .106, .054, .16
418	Upper Dome	C	C	29	Grout Nozzle	0.236
419	Upper Dome	A	B	3	Dent	.200 deep
420	Upper Dome	A	A	3	Grout Nozzle	0.23
421	Upper Dome	D	D	48	TW (LOF)	0.082
422	Upper Dome	D	D	44	Grout Nozzle	0.2
423	Upper Dome	D	D	39	LOF, LOF	.106, .218
425	Upper Dome	D	D	41	Grout Nozzle	0.206
426	Upper Dome	C	D	35	Gouge (BM)	.244 Deep
427	Upper Dome	C	D	36	Grout Nozzle	0.2
428	Upper Dome	C	D	29	Grout Nozzle	0.204
429	Upper Dome	C	D	32	Grout Nozzle	0.205
430	Upper Dome	C	D	30	Dent	.200 deep
431	Upper Dome	D	D	25	Grout Nozzle	0.223

4.0 PLATE TEST SUMMARY

Dunkin and Bush, Inc.
Honolulu, HI
Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
432	Upper Dome	D	E	20	TW	0.09
433	Upper Dome	D	E	20	TW	0.077
434	Upper Dome	D	E	20	TW	0.09
435	Upper Dome	D	E	20	TW	0.075
436	Upper Dome	C	E	16	LOF	0.1
437	Upper Dome	B	D	16	LOF, LOF	.120, .067
438	Upper Dome	B	D	16	Grout Nozzle	0.22
439	Upper Dome	B	D	17	LOF	0.096
440	Upper Dome	A	C	6	Grout Nozzle	0.23
441	Upper Dome	B	D	24	LOF	0.11
442	Upper Dome	B	D	21	LOF	0.185
443	Upper Dome	A	D	9	Grout Nozzle	0.21
444	Upper Dome	A	D	5	Grout Nozzle	0.205
445	Upper Dome	B	D	13	Grout Nozzle	0.21
446	Upper Dome	B	D	22	Dent	.180 deep
447	Upper Dome	B	E	10	LOF, LOF	.193, .235
448	Upper Dome	B	D	21	Grout Nozzle	0.215
449	Upper Dome	B	D	21	LOF	0.214
450	Upper Dome	D	D	43	Dent	.190 deep
451	Upper Dome	D	C	40	LOF	0.085
452	Upper Dome	C	D	32	LOF	0.099
453	Upper Dome	D	D	32	LOF/Pit, LOF	.196, .101
454	Upper Dome	D	D	47	Dent	0.200 Deep
455	Upper Dome	B	D	15	LOF,LOF	.099, .117
456	Lower Dome	A	2	2	Grout Nozzle	0.212
457	Lower Dome	A	4	2	Grout Nozzle	0.23
458	Lower Dome	A	3	1	Grout Nozzle	0.2
459	Barrel	A	5	1	Grout Nozzle	0.22
460	Barrel	A	1	1	Grout Nozzle	0.209
461	Barrel	D	12	16	Grout Nozzle	0.211
462	Barrel	D	19	16	Grout Nozzle	0.216
463	Barrel	D	26	P1	LOF, LOF	.077, .088
464	Barrel	D	27	1	Grout Nozzle	0.205
465	Extension	A	C2	1	NRI	N/A
466	Barrel	D	26	16	NRI	N/A
467	Barrel	D	26	16	LOF, LOF	.079, .083
468	Catwalk	A	3	2	LOF	0.077
469	Manway	A	3	Manway	LOF, LOF	.136, .239
470	Upper Dome	A	A	8	LOF	0.101
471	Upper Dome	B	A	31	LOF	0.071
472	Upper Dome	B	B	20	LOF	0.214
473	Upper Dome	B	B	20	LOF, LOF	.087, .127
474	Upper Dome	A	C	1	LOF, LOF	.091, .103
475	Upper Dome	A	C	3	LOF	0.138
476	Extension	D	4	39	LOF	0.12
477	Upper Dome	A	A	17	LOF, LOF, LOF, LOF	.069, .184, .089, .184
478	Upper Dome	D	A	65	LOF/POR	0.179
479	Upper Dome	D	A	66	LOF	0.085

4.0 PLATE TEST SUMMARY

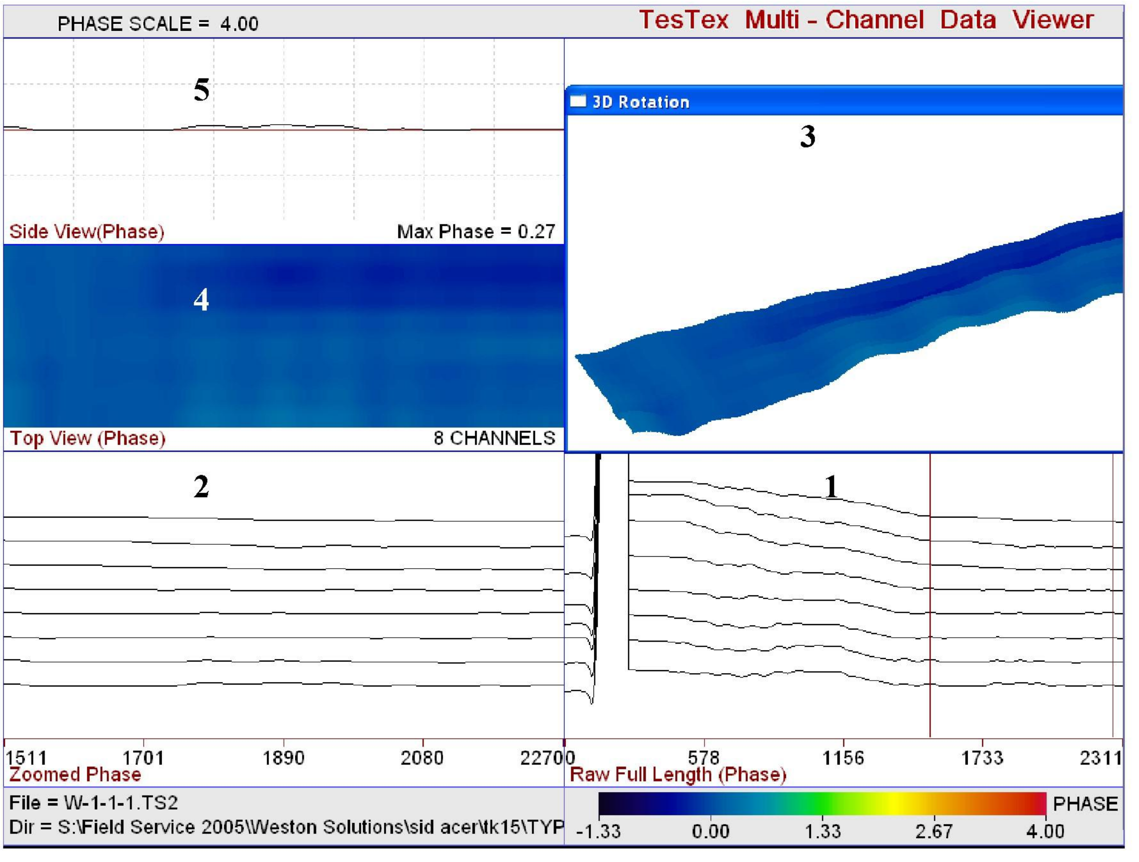
Dunkin and Bush, Inc.

Honolulu, HI

Tank #20

Flaw No.	Tank Section	Quad	Row / Course	Plate / Vertical Drop	Description of Flaw / Defect	Remaining Thickness/ Depth
480	Upper Dome	D	C	38	LOF/Pit, LOF/Pit	.107, .212
481	Upper Dome	B	C	20	LOF, LOF, LOF	.112, .202, .087
482	Lower Dome	B	1	12, 13	WELD CRACK	.75 Long

5.0 TYPICAL WAVEFORM
Dunkin and Bush, Inc.
Honolulu, HI
Tank #20



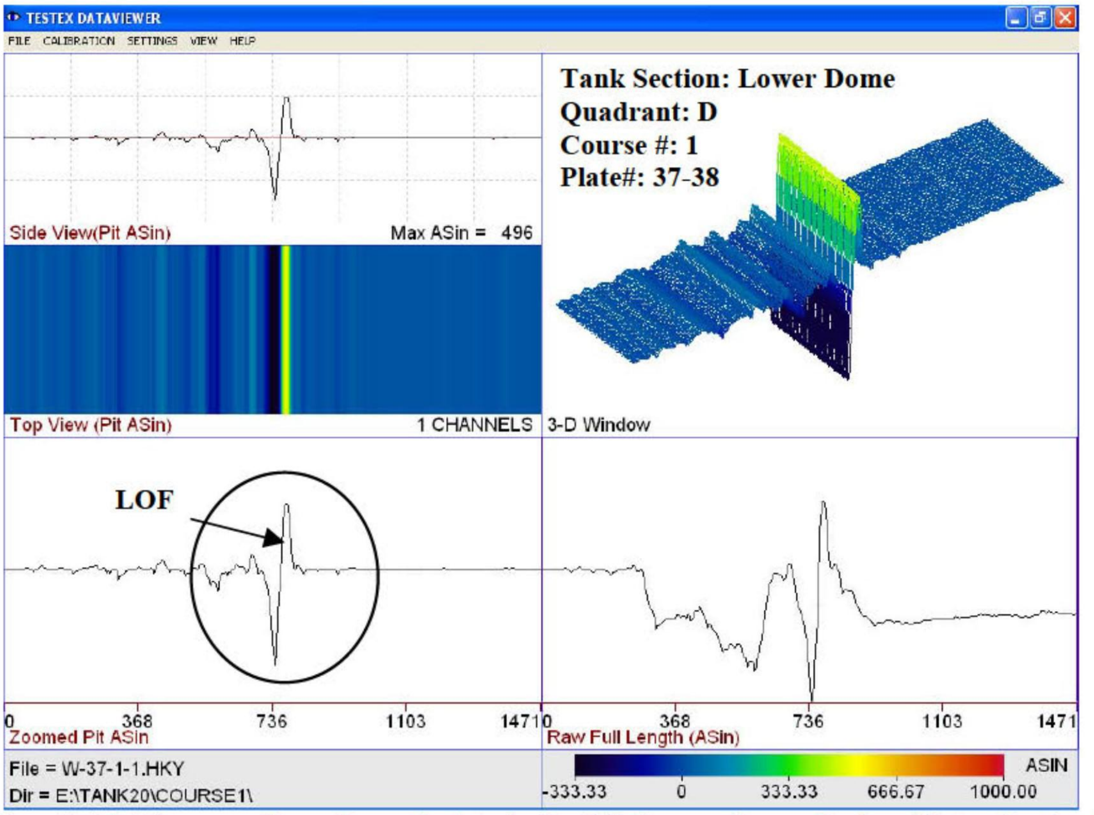
Shown above is a typical **TS-2000** waveform collected from the Barrel of Tank #15. This particular plate exhibits nominal wall thickness.

The **TS-2000** display has 5 windows to facilitate the interpretation of each plate. Window 1 shows raw data from the scanner before the signal is processed or filtered. Window 2 shows the raw data filtered and processed. Window 3 shows a 3-D view of the plate. Window 4 shows a topside view of the plate. Window shows the highest and lowest points of the plate baseline.

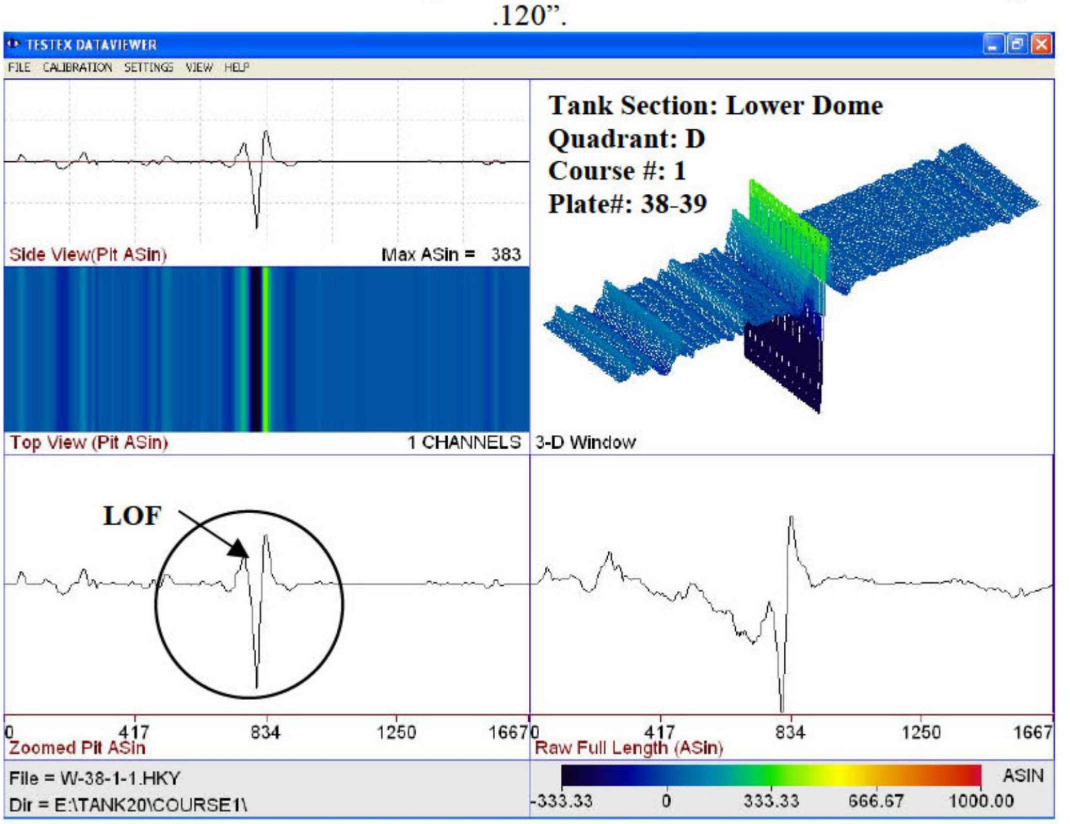
The **TS-2000** scanner is comprised of 8 sensors, which gives more sensitivity to pitting and cracking. A line in windows 1, 2, and 3 individually represents each sensor. Window 4 shows each sensor, and is color marked as it detects wall loss. Any rise in the waveform indicates wall loss. The magnitude of the response is given by a color, and is coded to the right of the waveform. From this color and comparing it to a calibration, a percent wall loss or wall remaining value can therefore be determined.

APPENDIX A – SAMPLE WAVEFORM

APPENDIX A – SAMPLE WAVEFORMS

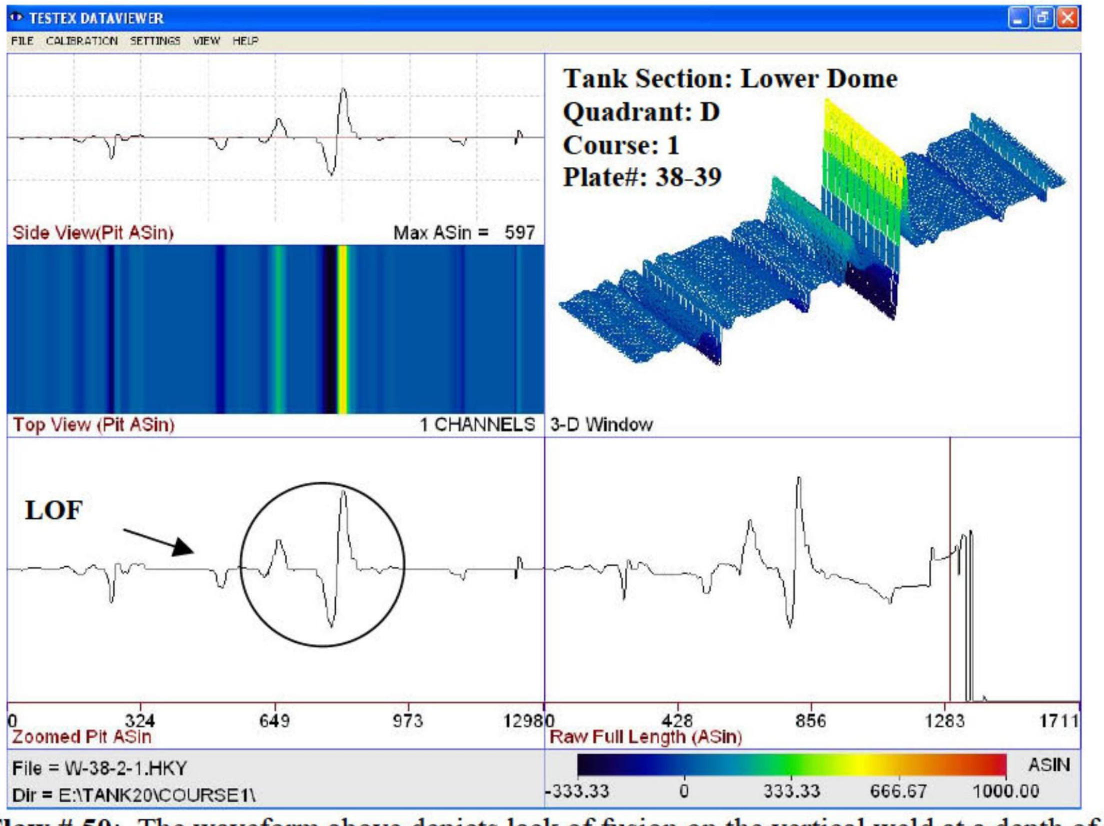


Flaw # 47: The waveform above depicts lack of fusion on the vertical weld at a depth of .120".

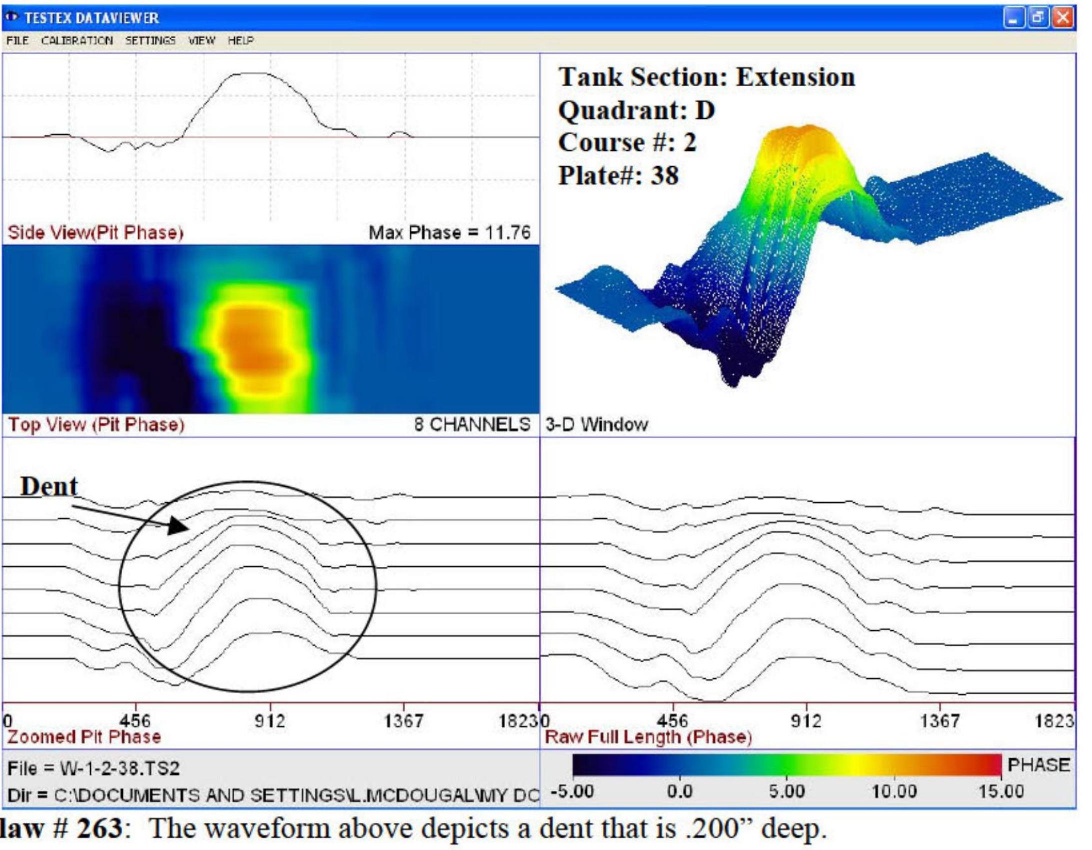


Flaw # 51: The waveform above depicts lack of fusion on the vertical weld at a depth of .118".

APPENDIX A – SAMPLE WAVEFORMS

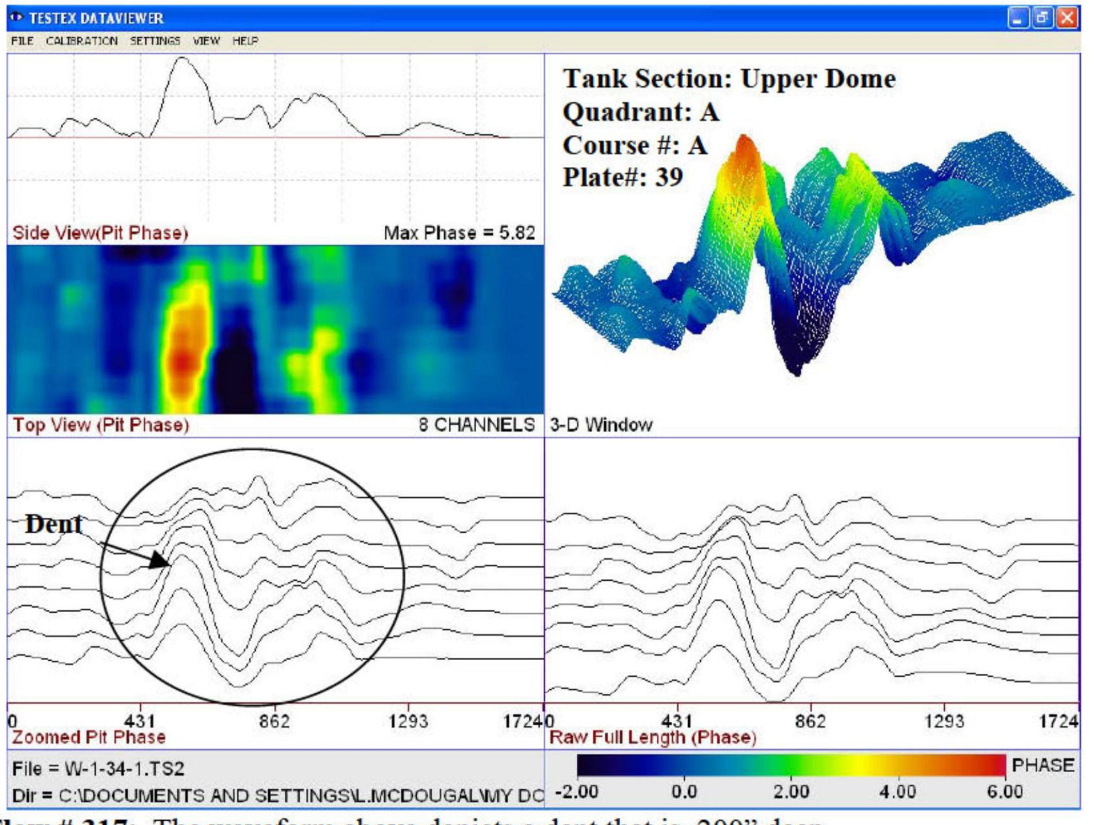


Flaw # 50: The waveform above depicts lack of fusion on the vertical weld at a depth of .089".

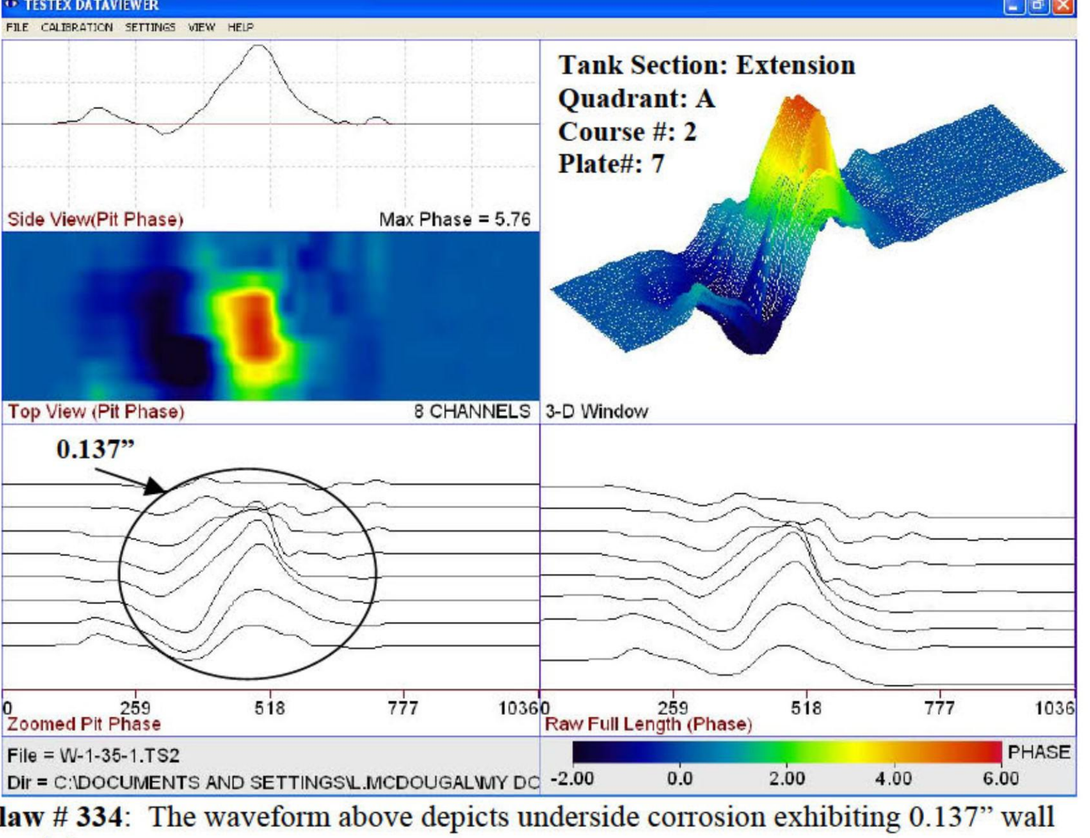


Flaw # 263: The waveform above depicts a dent that is .200" deep.

APPENDIX A – SAMPLE WAVEFORMS

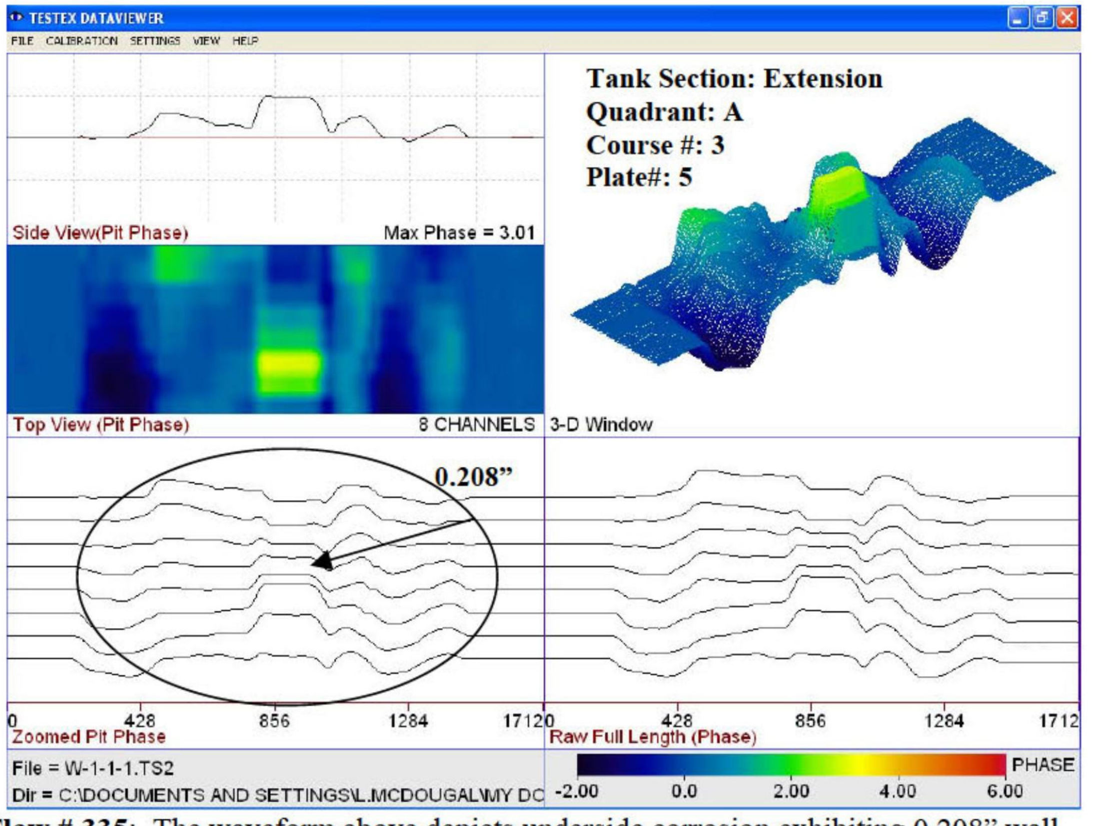


Flaw # 317: The waveform above depicts a dent that is .200" deep.

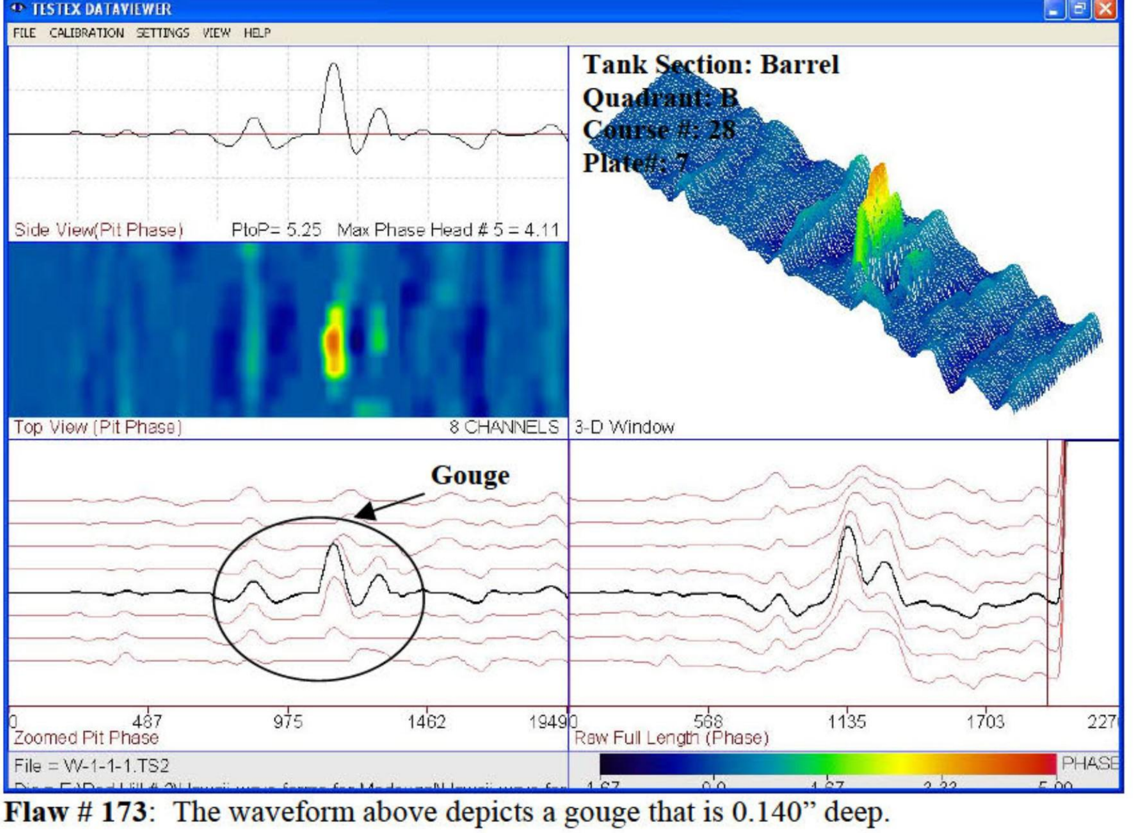


Flaw # 334: The waveform above depicts underside corrosion exhibiting 0.137" wall remaining.

APPENDIX A – SAMPLE WAVEFORMS

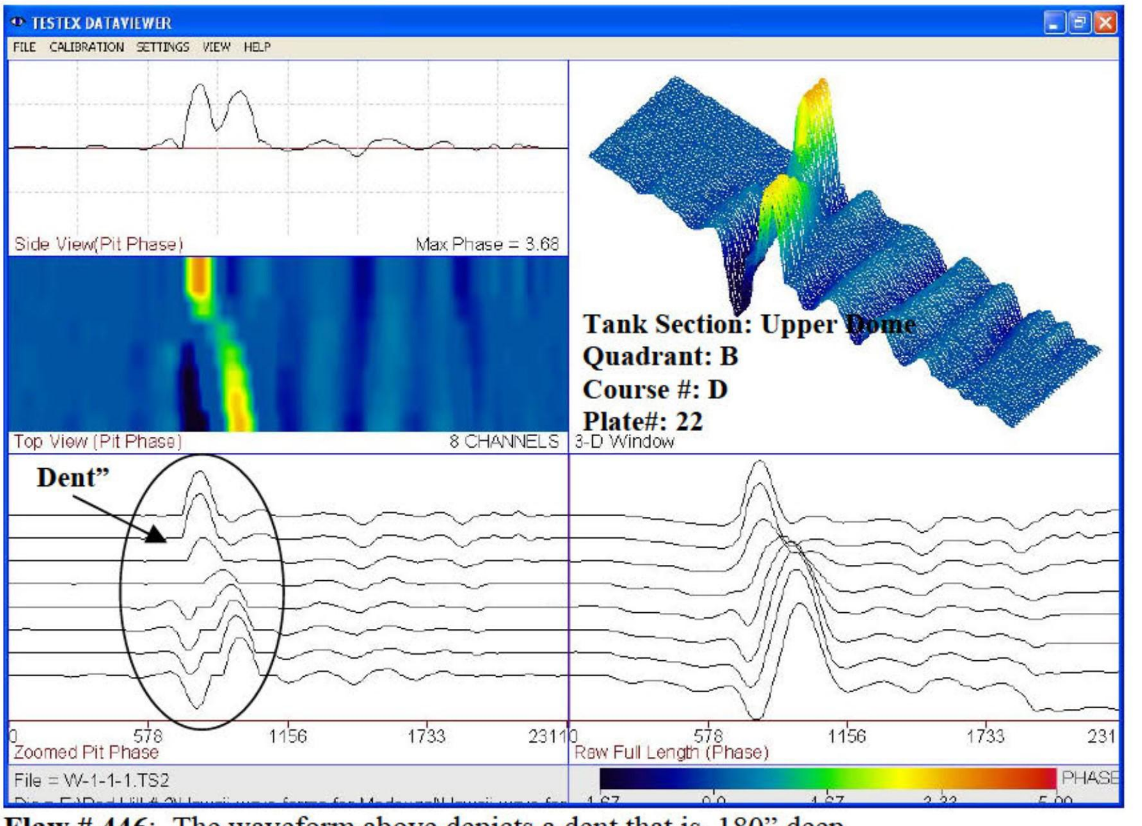


Flaw # 335: The waveform above depicts underside corrosion exhibiting 0.208" wall remaining.



Flaw # 173: The waveform above depicts a gouge that is 0.140" deep.

APPENDIX A – SAMPLE WAVEFORMS

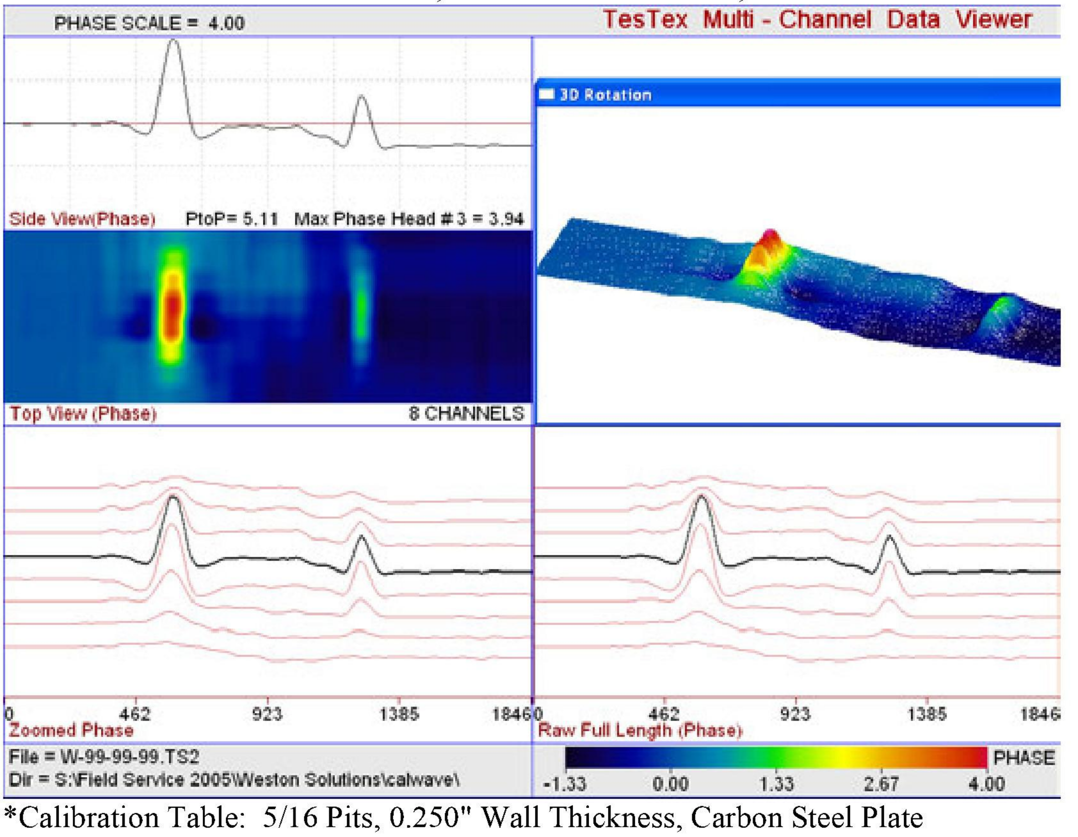


Flaw # 446: The waveform above depicts a dent that is .180" deep.

APPENDIX B – CALIBRATION

APPENDIX B – CALIBRATION

* Calibration Waveform: 5/16 Pits, 0.250" Wall Thickness, Carbon Steel Plate



*Calibration Table: 5/16 Pits, 0.250" Wall Thickness, Carbon Steel Plate

FREQ.: 10 Hz., PROBE#: 8.0" Scanner, FILE#: 99-99-99, DATE: 08/15/2008, UNIT#: TS-2000

% WL 1 = 30.00, PHASE 1 = 0.91, AMP 1 = 0.10 | *
% WL 2 = 60.00, PHASE 2 = 1.96, AMP 2 = 0.10 | * [QUADRATIC FIT]%

WALL LOSS	DELTA PHASE	DELTA LNA	WALL REMAINING
5.0	0.14	0.03	0.238
10.0	0.29	0.05	0.225
15.0	0.44	0.06	0.213
20.0	0.59	0.08	0.200
25.0	0.75	0.09	0.188
30.0	0.91	0.10	0.175
35.0	1.08	0.11	0.163
40.0	1.25	0.11	0.150
45.0	1.42	0.11	0.138
50.0	1.60	0.11	0.125
55.0	1.78	0.11	0.113
60.0	1.96	0.10	0.100
65.0	2.15	0.09	0.088
70.0	2.34	0.08	0.075

APPENDIX C – TEST METHODS/PROCEDURES AND EQUIPMENT DESCRIPTION

APPENDIX C – TEST METHODS/PROCEDURES AND EQUIPMENT DESCRIPTION

Principles of LFET

Low Frequency Electromagnetic Technique (LFET) was developed out of further research of Remote Field Electromagnetic Technique (RFET). The main difference of LFET is the placement of the sensors between the two poles of an electromagnetic driver.

With a low frequency AC driver signal of 3 to 40 Hz for carbon steel (see Figure 1), the driver signal fully penetrates the material being tested. When the scanner passes over an area with no defects, the magnetic fields are not distorted.

When the test material has a defect and the sensors are located above that defect, distortions in the magnetic field indicate presence of the flaw. LFET instruments measure this distortion as changes in phase and amplitude. Depth of the flaw is proportional to these phase and amplitude changes. Diameter of the defect is related to the number of sensors affected.

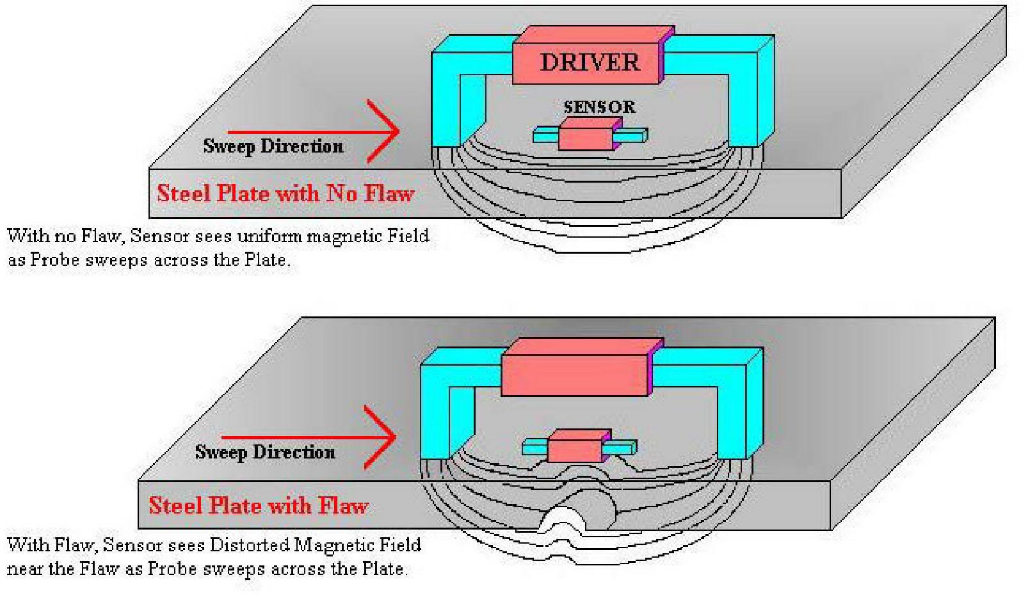


Figure 1.
Principles of Low Frequency Electromagnetic Technique (LFET)

APPENDIX C – TEST METHODS/PROCEDURES AND EQUIPMENT DESCRIPTION

Tank Floor Scanning Theory/Background

FALCON 2000 SYSTEM

The TesTex Tank Floor Inspection System consists of a sixteenth inch modular swath containing 32 probe heads. This configuration allows for a 100% coverage of the tank plate. The probe emits a very low frequency electromagnetic field which penetrates the tank floor. Any variation in the tank floor thickness will cause the electromagnetic field to change. These changes are very small, which makes it necessary to use digital signal processing to enhance the resulting signal. The resulting processed signal is in the form of phase and amplitude readings. Calibration tables are used to convert these signals into percentage wall loss values.

PROCEDURES

Each tank floor is mapped out by measuring the length, width, and orientation of the individual plates. The wall loss information for each plate is stored on a floppy disk.

SOFTWARE

The data acquisition module collects the plate data at a given sample rate. The menu-driven program provides for real-time display of phase, amplitude, and probe position across the plate. The x-y geometry of the plate, probe speed, and other details are also handled by the data acquisition module.

The data analysis and display module contain the calibration curves for wall thinning, volume losses, and pitting. His module correlates calibration standards information with the plant data for flaw sizing and evaluation. Several routines for digital the filtering, averaging techniques, background evaluation, curve fitting, and other useful signal processing techniques are also available. Up to 16 waveforms can be displayed simultaneously in the screen while "zooming" algorithms are used to easily examine small segments of the waveforms.

Plate Scanning Theory/Background

To test vertically/horizontally-oriented plates, the ***TS 2000*** scanner is placed on an unobstructed area on the topside of one of the plates. The equipment is then zeroed using the ***TS 2000 PLATE SCAN*** software's auto-set function. This action also selects the right time constant, sets the gains of the internal amplifiers, and ensures that the data is displayed on the screen as it is being collected.

After zeroing, the scanner is moved to the beginning of the scan sweep area. The scanner is then gradually moved across the surface of the tube and data is collected via magnetic medium on the PC. The processing of the data occurs real-time and the data is stored as several waveforms and stored as several signal responses. Among these are phase and amplitude for each individual channel.

APPENDIX C – TEST METHODS/PROCEDURES AND EQUIPMENT DESCRIPTION

SYSTEM DESCRIPTION

ELECTRONICS: The digital system consists of function generators, power amplifiers, difference amplifiers, phase rotators, auto-zero phase shifters, A-to-D converters, digital controllers, etc. One of the key design objectives was to achieve as low a noise as possible. We detect phase changes to an accuracy of 1/10 of a degree and amplitude signals of a fraction of a microvolt. The ***TS 2000*** contains all the electronics and software for data acquisition. It contains an internal A-to-D converter, which connects to the PC through a serial port.

SOFTWARE: Consists of two modules

The data acquisition module collects the tube data at a given sample rate. The menu driven, user-oriented program provides for real-time display of phase, amplitude, and probe position in the tube. The row and column of the tube, probe speed, and other bookkeeping details are also handled by the data acquisition module.

The data analysis and display module contains the calibration curves for plate thinning, volume losses, pits, vibration/fret wear, and correlates the calibration standard information with the actual plant data for flaw sizing and evaluation. It has routines for digital filtering, averaging techniques, background evaluation, curve fitting, and other useful signal processing techniques. Up to three waveforms can be displayed simultaneously on the screen and the "zooming" algorithm enables the user to easily examine small segments of the waveform.

DETECTION ACCURACY

The ***TesTex, Inc.*** developed lock-in amplifier is capable of measuring very low level signals in the microvolt range and can measure small phase angle changes of a fraction of a degree, even in the presence of a considerable amount of noise. This system, when used in conjunction with the calibration standards: partial and through-wall pitting, gradual wall thinning. Hydrogen damage, etc. and their respective calibration curves, allows us to measure small gradual wall losses on the order of 10%, pits of diameter 0.062" (1.57mm), and vibration/fret wear of five volume percent.

Weld Scanning Theory/Background

TesTex, Inc. has developed a special electromagnetic probe based on the principle of achieving a "balanced field" for the probe. This probe is also very sensitive to small changes in electromagnetic field and the noise is significantly reduced by appropriate phase rotation of the horizontal and vertical component of the signal. A single element probe of this type was used to detect "surface and subsurface cracking" This probe was called Hawkeye and it is successfully used for testing cracks, welds, pipes, plates, etc.

The system works by PHASE ROTATING liftoff noise into the ACOS signal while leaving the CRACK signal in the ASIN waveform. Processing is used to reduce gradual changes in the waveform to make detection easier.

APPENDIX C – TEST METHODS/PROCEDURES AND EQUIPMENT DESCRIPTION

Ultrasonic Shear Wave (Angle Beam) Testing Description

The instrument used for Shear Wave or Angle Beam Testing is a simple pulse-echo flaw detector with A-Scan, receiving, and transmitting capabilities in which the user can size the length, depth, and distance of the flaw.

The primary reason for using shear waves is for the detection of discontinuities with geometries and orientations non-parallel to the testing surface. The Angle Beam technique is extensively used for weld testing at ½ step and full step distances. The frequency range specifically for weld testing with angle beam transducers is 1MHz to 5MHz. The most common Angle Beam contact transducers are designed to produce shear waves of 45, 60, and 70° in steel.

APPENDIX D – TANK INTERIOR PHOTOGRAPHS

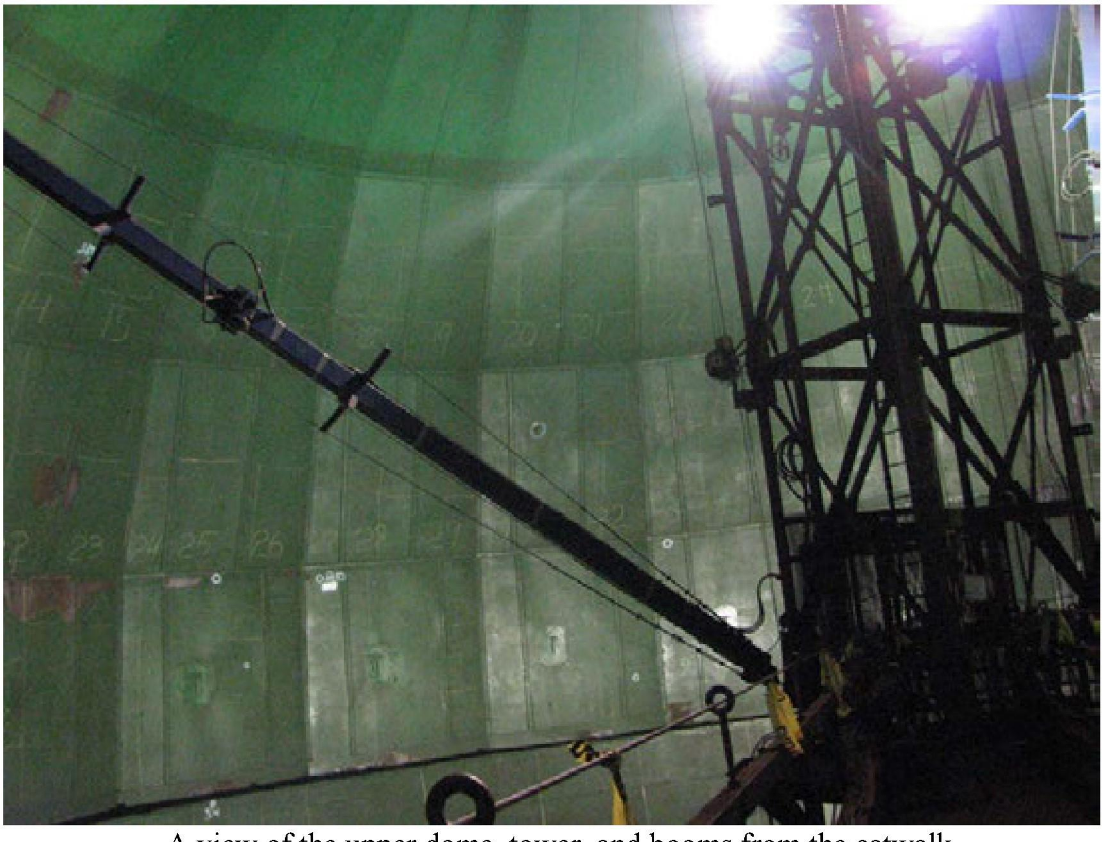
Note: Pictures in this section are from tank # 2. No pictures were taken in tank #20

APPENDIX D – TANK INTERIOR PHOTOGRAPHS

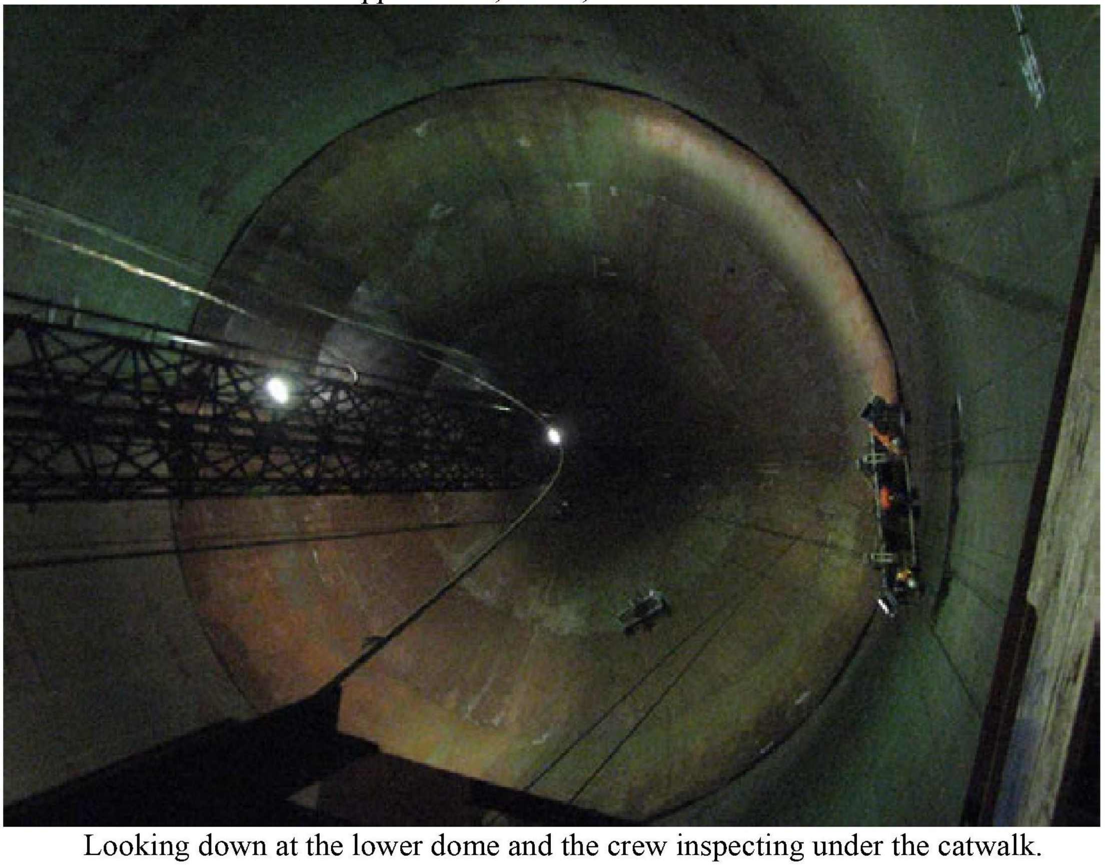
A view of the tunnel area around tank #2.

A view of the manway leading into tank #2.

APPENDIX D – TANK INTERIOR PHOTOGRAPHS

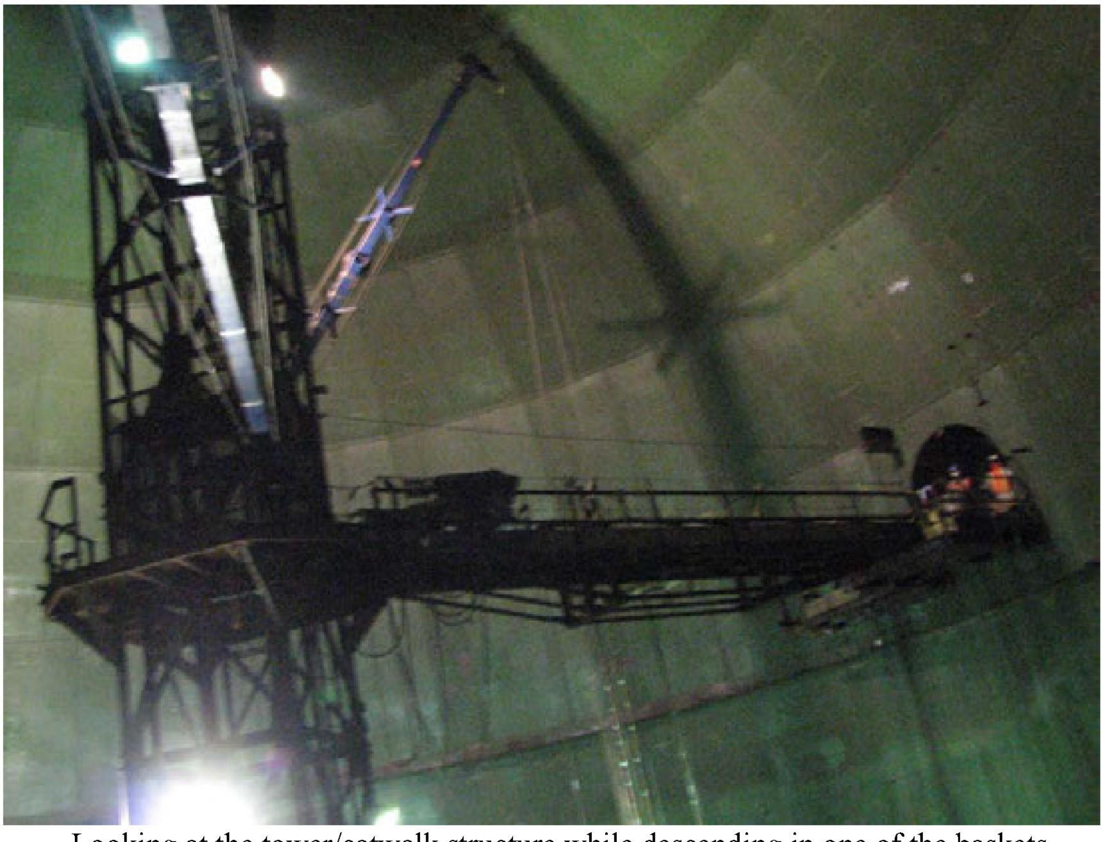


A view of the upper dome, tower, and booms from the catwalk.

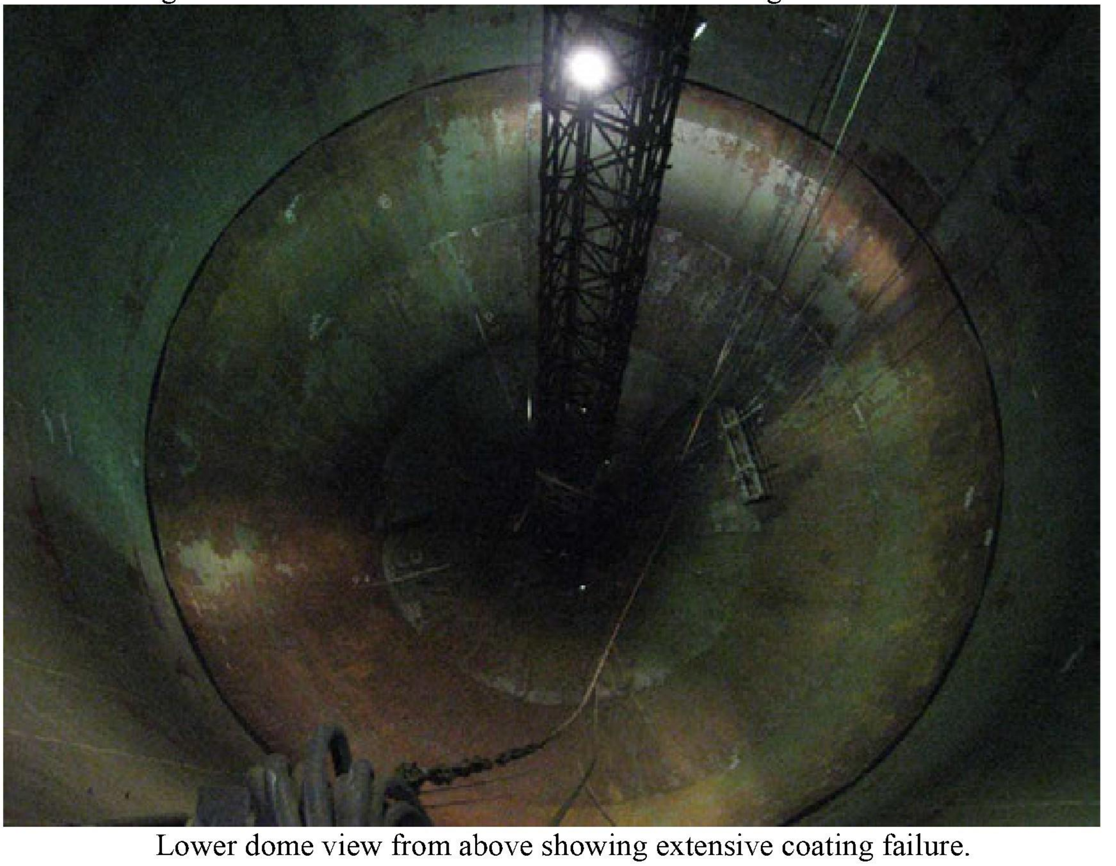


Looking down at the lower dome and the crew inspecting under the catwalk.

APPENDIX D – TANK INTERIOR PHOTOGRAPHS



Looking at the tower/catwalk structure while descending in one of the baskets.



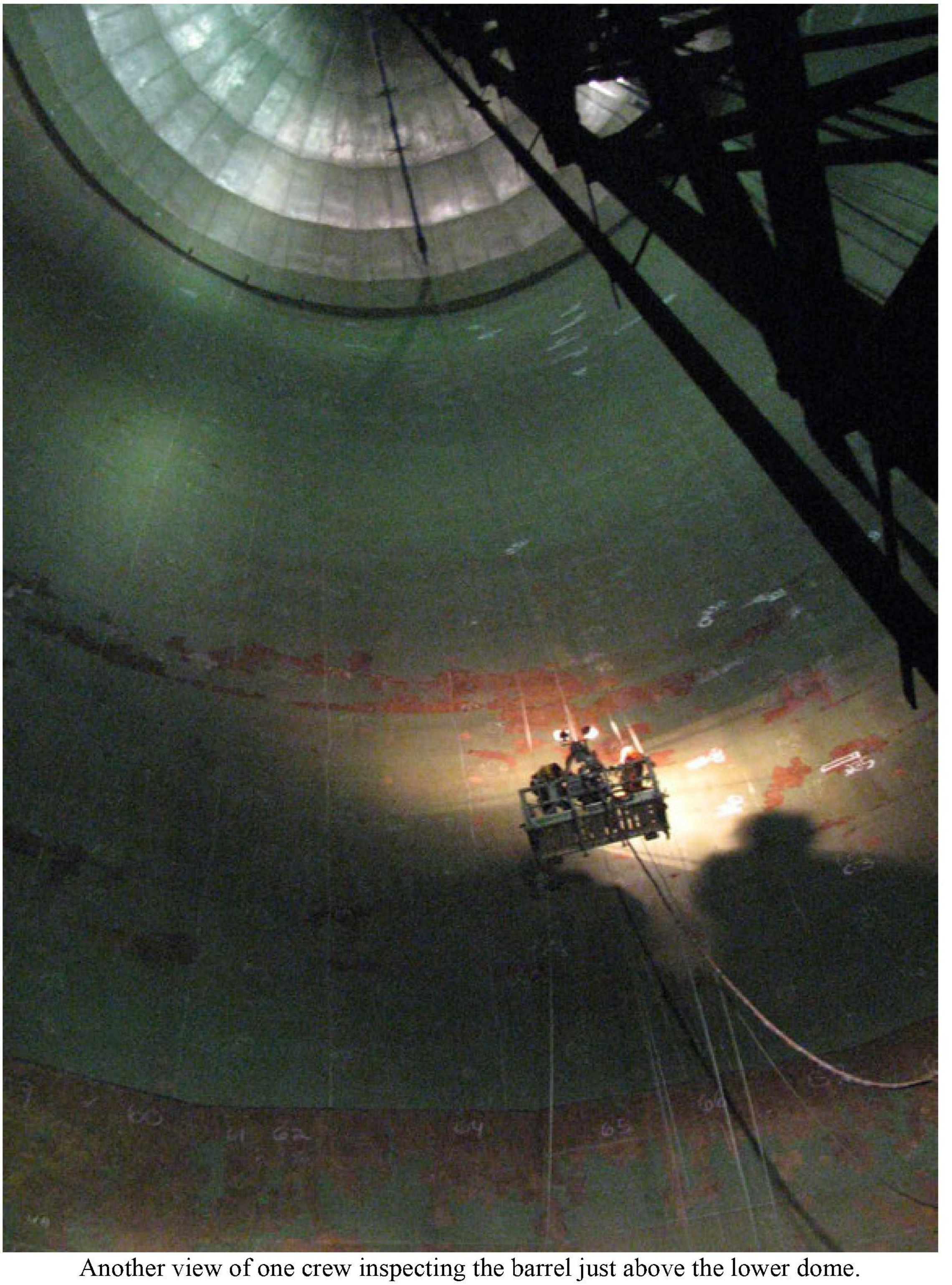
Lower dome view from above showing extensive coating failure.

APPENDIX D – TANK INTERIOR PHOTOGRAPHS

A view from the tank bottom of one of the teams scanning the barrel

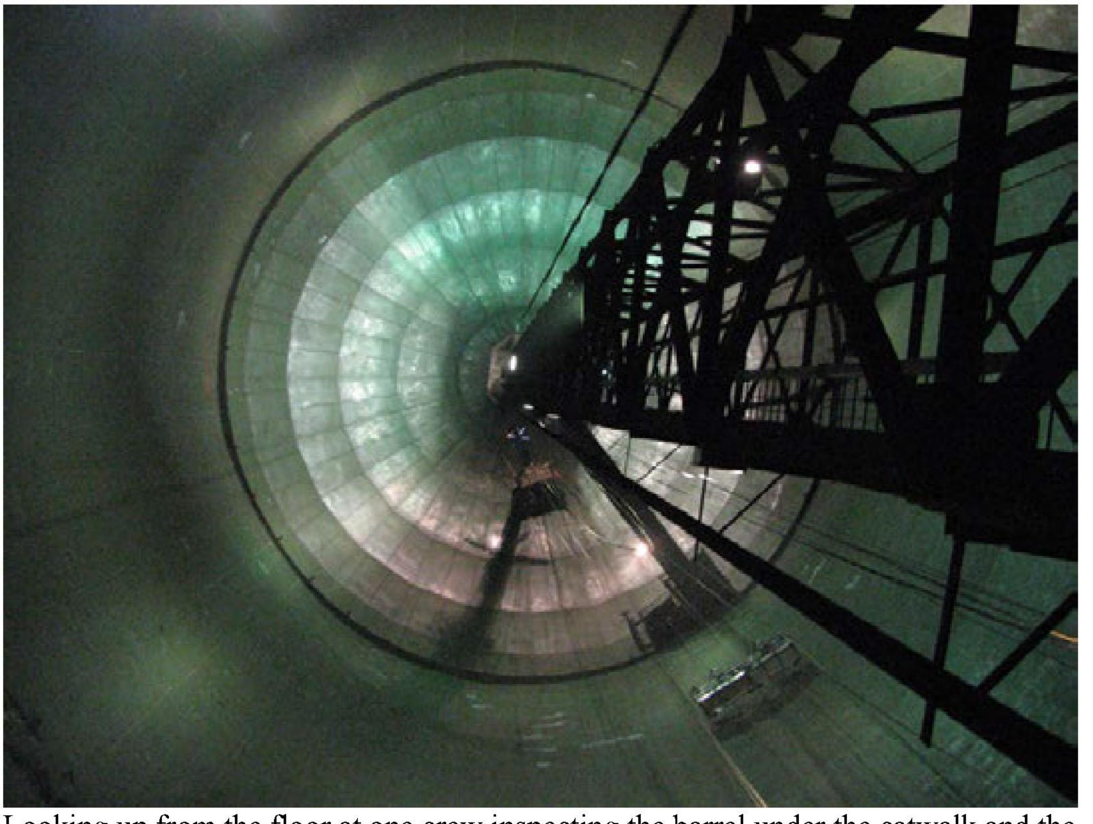
.
Picture showing part of the floor and lower dome

APPENDIX D – TANK INTERIOR PHOTOGRAPHS

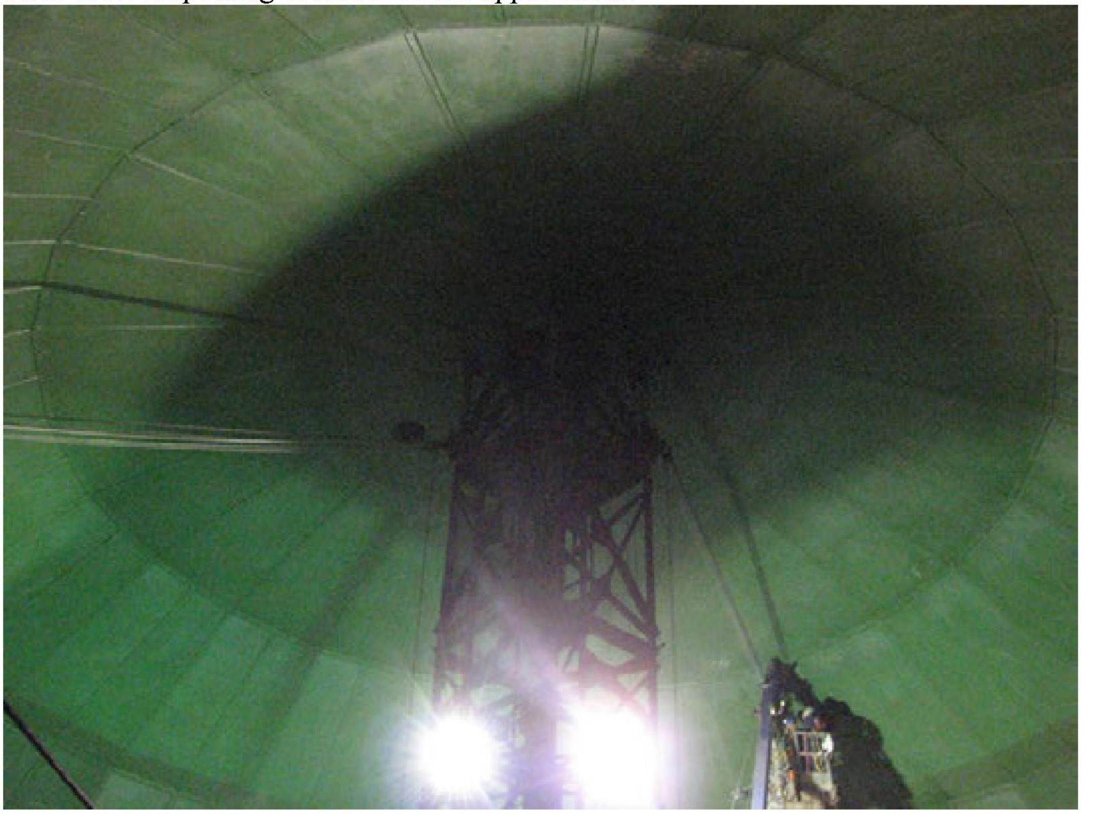


Another view of one crew inspecting the barrel just above the lower dome.

APPENDIX D – TANK INTERIOR PHOTOGRAPHS

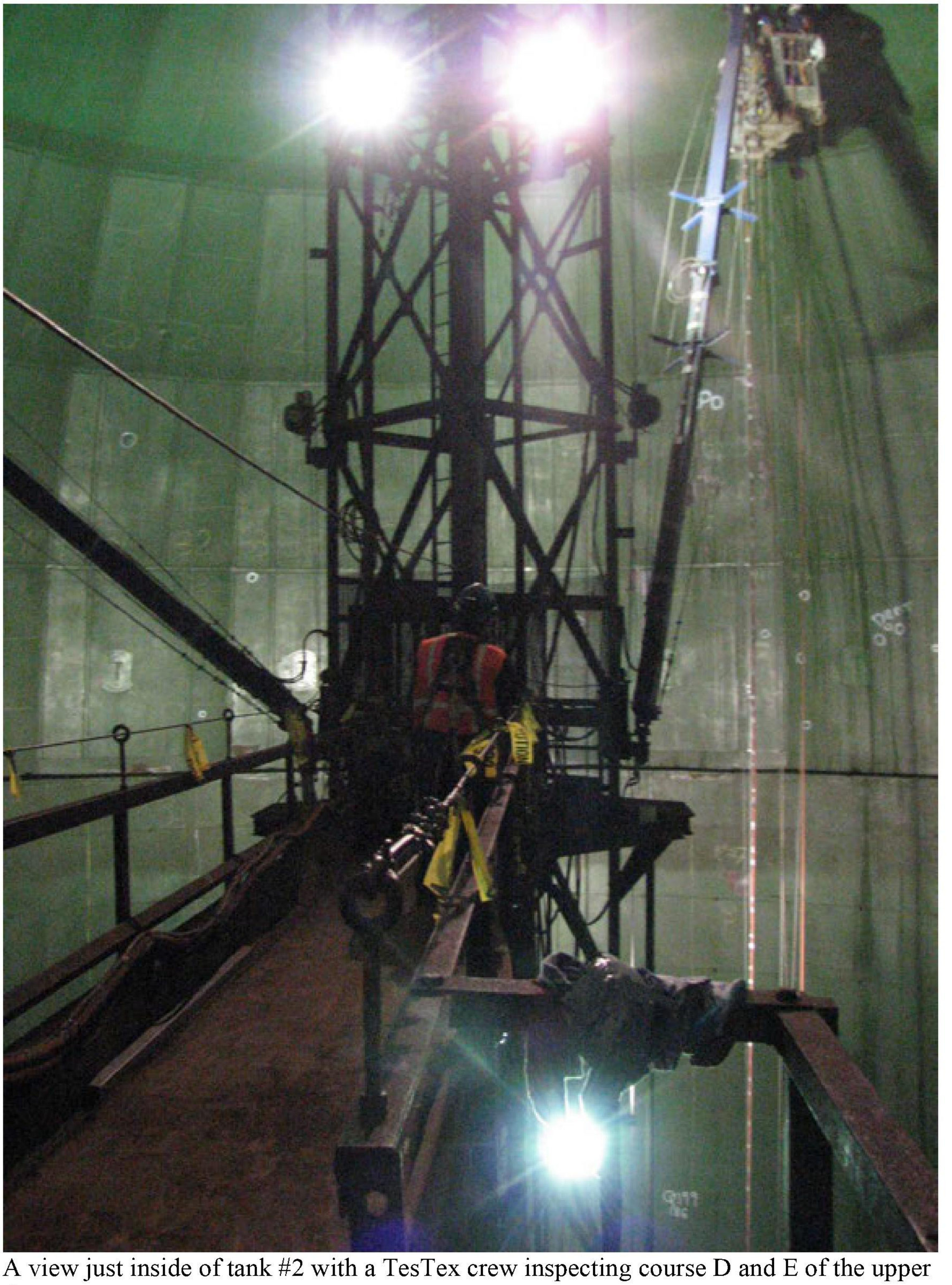


Looking up from the floor at one crew inspecting the barrel under the catwalk and the other crew-inspecting course E of the upper dome.



A view of the very top of tank # 2 showing courses D, E, and F with a TesTex crew

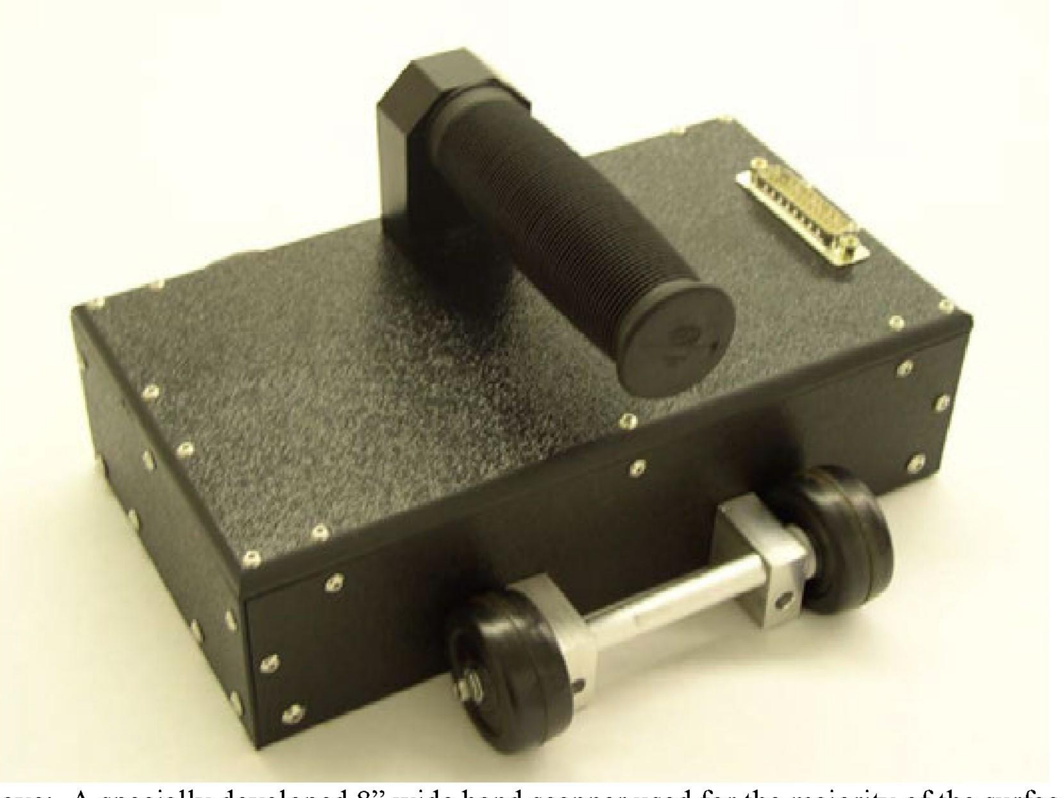
APPENDIX D – TANK INTERIOR PHOTOGRAPHS



A view just inside of tank #2 with a TesTex crew inspecting course D and E of the upper dome.

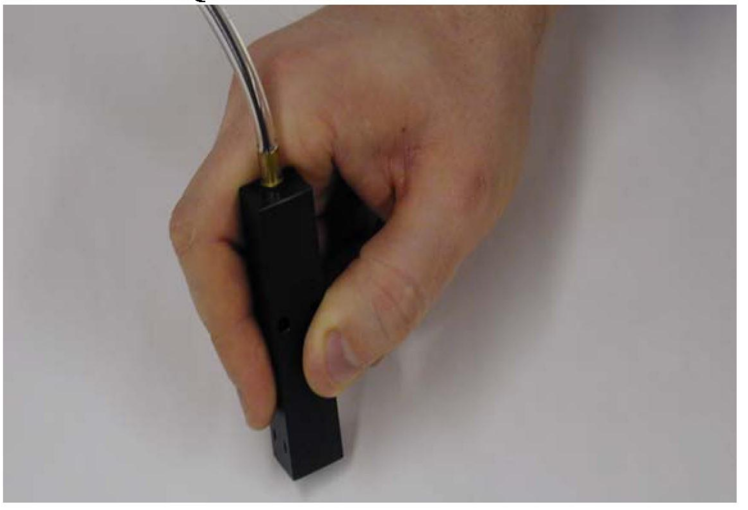
APPENDIX E – TESTEX EQUIPMENT

APPENDIX E – TESTEX EQUIPMENT



Above: A specially developed 8" wide hand scanner used for the majority of the surface scanning. Below: A TesTex crewmember using the hand scanner from one of the baskets.

APPENDIX E – TESTEX EQUIPMENT



Above: The Hawkeye Pencil Probe used for testing all welds in tank # 2. Below: A TesTex crewmember using the Hawkeye a weld from one of the baskets.

APPENDIX F – DEFECT AREA PHOTOGRAPHS AND REPORT

Baker Inspection Group, LLC

MAGNETIC PARTICLE INSPECTION REPORT [X]   LIQUID PENETRANT INSPECTION REPORT [ ]

WE ASSUME NO RESPONSIBILITY FOR LOSSES OF ANY KIND DUE TO OUR INTERPRETATION OF THE QUALITY OF THE MATERIAL SUBMITTED. ALL DATA/INFORMATION WILL BE HELD CONFIDENTIAL.

CLIENT NAME Dunkin & Bush, Inc. **CLIENT PURCHASE ORDER NO.** ______ **DATE** 10-20-08

JOB LOCATION Red Hill, Hawaii, Tank # 20 **CLIENT JOB NO.** ______ **REPORT NO.** 102008-01 **BAKER JOB#** TesTex

M.T. MACHINE Parker Probe **MT PROCEDURE NO.:** NDT-003 **MT ACCEPTANCE STANDARD:** ASTM-Sect. VIII, Appendix 6

D.C. [ ] **A.C.** [X] **D.C. RECTIFIED** [ ] **YOKE** [X] **PRODS** [ ] **COIL** [ ] **CABLE** [ ] **CLAMP** [ ]

EQUIPMENT S/N# ______ **AMP SETTING** Fixed **DRY POWDER TYPE** 8A Red **WET SUSPENSION TYPE** N/A

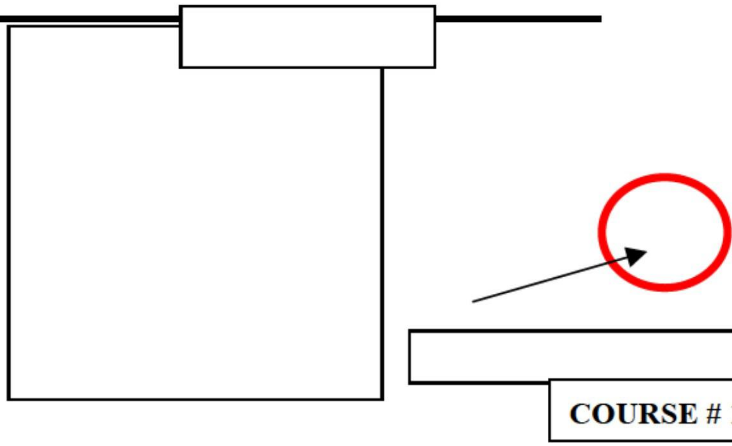
PT [ ] **FPT** [ ] **PT PROCEDURE NO.:** N/A **PT ACCEPTANCE STANDARD:** N/A **LIGHTING** +100 FT/CND

PENE°/PART° N/A **MATL. CERT#: PENE.** N/A **CLNR.** N/A **DEVE.** N/A **MATERIAL TYPE/SPEC.** Carbon Steel

COMPONENT DESCRIPTION: Tank # 20 – Lower Dome Backer Strip Fillet Welds @ Floor/Course # 1 **THICKNESS** 0.250” **DIMENSIONS** Various

SPECIMEN, WELD, AND /OR PART NUMBER	AREA	SURFACE CONDITIONS	ACCEPT	REJECT	TYPE INDICATION	REMARKS:
Top & Bottom Backer Strip Fillet Welds. Backer Strip Splice Welds.						Note: Minor to moderate pitting of welds and base metal.
Junction 1 to 5	Fillets & Splices	As Welded, Power Wire Brushed	X		NRI	NRI = No Reportable Indications at Time of Testing.
Junction 12/13 Top Intersection.	Top Fillet	As Welded, Power Wire Brushed		X	Linear	¾” Linear Indication @ Junction. Weld Stop Creator Crack
Junction 13 to 44	Fillets & Splices	As Welded, Power Wire Brushed	X		NRI	NRI = No Reportable Indications at Time of Testing.

TEST RESULTS:
PHOTO: [ ] **SKETCH:** [ ]



TECHNICIAN (1) Jeffrey Miller **ASNT LEVEL** II **TECHNICIAN (2)** N/A **ASNT LEVEL** N/A

CLIENT REVIEWER: ______ **DATE:** 10-20-08

Form No. NDE-121.QA

Baker Inspection Group, LLC

MAGNETIC PARTICLE INSPECTION REPORT [X]   LIQUID PENETRANT INSPECTION REPORT [ ]

WE ASSUME NO RESPONSIBILITY FOR LOSSES OF ANY KIND DUE TO OUR INTERPRETATION OF THE QUALITY OF THE MATERIAL SUBMITTED. ALL DATA/INFORMATION WILL BE HELD CONFIDENTIAL.

CLIENT NAME Dunkin & Bush, Inc. **CLIENT PURCHASE ORDER NO.** ______ **DATE** 10-21-08

JOB LOCATION Red Hill, Hawaii, Tank # 20 **CLIENT JOB NO.** ______ **REPORT NO.** 102108-02 **BAKER JOB#** TesTex

M.T. MACHINE Parker Probe **MT PROCEDURE NO.:** NDT-003 **MT ACCEPTANCE STANDARD:** ASTM-Sect. VIII, Appendix 6

D.C. [ ] **A.C.** [X] **D.C. RECTIFIED** [ ] **YOKE** [X] **PRODS** [ ] **COIL** [ ] **CABLE** [ ] **CLAMP** [ ]

EQUIPMENT S/N# ______ **AMP SETTING** Fixed **DRY POWDER TYPE** 8A Red **WET SUSPENSION TYPE** N/A

PT [ ] **FPT** [ ] **PT PROCEDURE NO.:** N/A **PT ACCEPTANCE STANDARD:** N/A **LIGHTING** +100 FT/CND

PENE°/PART° N/A **MATL. CERT#: PENE.** N/A **CLNR.** N/A **DEVE.** N/A **MATERIAL TYPE/SPEC.** Carbon Steel

COMPONENT DESCRIPTION: Tank # 20 – Lower Dome Backer Strip Fillet Welds @ Floor/Course # 1 **THICKNESS** 0.250" **DIMENSIONS** Various

SPECIMEN, WELD, AND /OR PART NUMBER	AREA	SURFACE CONDITIONS	ACCEPT	REJECT	TYPE INDICATION	REMARKS:	TEST RESULTS: PHOTO: [ ] SKETCH: [ ]
Top & Bottom Backer Strip Fillet Welds. Backer Strip Splice Welds.							Note: Minor to moderate pitting of welds and base metal.
Junction 5 to 12	Fillets & Splices	As Welded, Power Wire Brushed	X		NRI	NRI = No Reportable Indications at Time of Testing.	

TECHNICIAN (1) Jeffrey Miller **ASNT LEVEL** II **TECHNICIAN (2)** N/A **ASNT LEVEL** N/A

CLIENT REVIEWER: ______ **DATE:** 10-21-08

Form No. NDE-121.QA

APPENDIX G – SHEAR WAVE REPORT AND CALIBRATIONS

Baker Inspection Group, LLC

ASME FLAW ULTRASONIC INSPECTION REPORT

REPORT NO. ____________________ DATE: ______________

CLIENT: ________________ JOB LOCATION: ________________ JOB NO. __________

CLIENT PO# __________ CLIENT JOB NO: __________ INSTRUMENT TYPE/SN# __________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. __________ TEST SURFACE TEMP. ____ °F

MATERIAL ____________ THICKNESS _____ in. or SCHEDULE _______ DIAMETER _____ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE ________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________ Y-Axis ________________

SURFACE CONDITION ________________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

TECHNICIAN ________________ SNT-TC-1A LEVEL ________ DATE __________

CLIENT REVIEW ________________ DATE __________ PAGE ____ OF ____

Baker Inspection Group, LLC

ASME FLAW ULTRASONIC INSPECTION REPORT

REPORT NO. ____________________ DATE: ______________

BAKER INSPECTION GROUP ASSUMES NO RESPONSIBILITY FOR LOSSES OF ANY KIND DUE TO OUR INTERPRETATION OF THE QUALITY OF MATERIAL SUBMITTED. ALL DATA IS HELD STRICTLY CONFIDENTIAL. (FORM No. 123R1 QA)

CLIENT: ______________ JOB LOCATION: ______________ JOB NO. ____________

CLIENT PO# ____________ CLIENT JOB NO: ____________ INSTRUMENT TYPE/SN# ____________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. __________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________ Y-Axis ______________

SURFACE CONDITION ______________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
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CLIENT REVIEW ______________ DATE ____________ PAGE ____ OF ____

Baker Inspection Group, LLC

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CLIENT PO# ______________ CLIENT JOB NO: ______________ INSTRUMENT TYPE/SN# ______________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. ______________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________ Y-Axis ______________

SURFACE CONDITION ______________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

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Baker Inspection Group, LLC

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MATERIAL ______________________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ______________________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________________________ Y-Axis ______________________________

SURFACE CONDITION ______________________________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

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SKETCH:

COMPONENT DRAWING NO.

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CLIENT REVIEW ______________ DATE ______________ PAGE ____ OF ____

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COMPONENT DESCRIPTION ______________________ TEST SURFACE ___________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________________ Y-Axis ______________________

SURFACE CONDITION ____

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

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CLIENT REVIEW ______________________ DATE ______________ PAGE ____ OF ____

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CLIENT PO# ______________ CLIENT JOB NO: ______________ INSTRUMENT TYPE/SN# ______________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. ______________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE ___________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________ Y-Axis ______________

SURFACE CONDITION ______________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

TECHNICIAN ______________ SNT-TC-1A LEVEL __________ DATE ______________

CLIENT REVIEW ______________ DATE ______________ PAGE ____ OF ____

BAKER INSPECTION GROUP

Baker Inspection Group, LLC

ASME FLAW ULTRASONIC INSPECTION REPORT

REPORT NO. ____________________ DATE: ______________

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CLIENT: ______________________ JOB LOCATION: ______________________ JOB NO. ____________

CLIENT PO# ______________ CLIENT JOB NO: ______________ INSTRUMENT TYPE/SN# ______________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. __________ TEST SURFACE TEMP. ____ °F

MATERIAL __________________ THICKNESS _____ in. or SCHEDULE ______ DIAMETER _____ in.

COMPONENT DESCRIPTION ______________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________________ Y-Axis ______________________

SURFACE CONDITION ____

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS

SKETCH:

COMPONENT DRAWING NO.

TECHNICIAN ______________________ SNT-TC-1A LEVEL __________ DATE ____________

CLIENT REVIEW ______________________ DATE ____________ PAGE ____ OF ____

Baker Inspection Group, LLC

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CLIENT PO# ______________ CLIENT JOB NO: ________________ INSTRUMENT TYPE/SN# ______________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. ____________ TEST SURFACE TEMP. ____ °F

MATERIAL ________________ THICKNESS _____ in. or SCHEDULE ______ DIAMETER _____ in.

COMPONENT DESCRIPTION ________________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________________ Y-Axis ________________________

SURFACE CONDITION ____

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CLIENT: ________________ JOB LOCATION: ________________ JOB NO. __________

CLIENT PO# __________ CLIENT JOB NO: __________ INSTRUMENT TYPE/SN# __________

INST CAL. DATE ______ PROCEDURE _____ REV. ____ ACCEPTANCE STD. __________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________ Y-Axis ________________

SURFACE CONDITION ________________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

TECHNICIAN ____________________ SNT-TC-1A LEVEL __________ DATE ____________

CLIENT REVIEW ____________________ DATE ____________ PAGE ____ OF ____

Baker Inspection Group, LLC

ASME FLAW ULTRASONIC INSPECTION REPORT

REPORT NO. ____________________ DATE: ______________

BAKER INSPECTION GROUP ASSUMES NO RESPONSIBILITY FOR LOSSES OF ANY KIND DUE TO OUR INTERPRETATION OF THE QUALITY OF MATERIAL SUBMITTED. ALL DATA IS HELD STRICTLY CONFIDENTIAL. (FORM No. 123R1 QA)

CLIENT: ______________________________ JOB LOCATION: ______________________________ JOB NO. ________________

CLIENT PO# __________________ CLIENT JOB NO: ____________________ INSTRUMENT TYPE/SN# ______________________

INST CAL. DATE _________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. _______________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________________ THICKNESS _____ in. or SCHEDULE _______ DIAMETER _____ in.

COMPONENT DESCRIPTION ____________________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________________________ Y-Axis ____

SURFACE CONDITION ____

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS

SKETCH:

COMPONENT DRAWING NO.

TECHNICIAN ____________________________________ SNT-TC-1A LEVEL __________ DATE ______________

CLIENT REVIEW ____________________________________ DATE ______________ PAGE ____ OF ____

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MATERIAL ____________ THICKNESS _____ in. or SCHEDULE _______ DIAMETER _____ in.

COMPONENT DESCRIPTION ________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________ Y-Axis ________________

SURFACE CONDITION ________________________________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS

SKETCH:

COMPONENT DRAWING NO.

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INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. ______________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________ Y-Axis ______________

SURFACE CONDITION ______________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

TECHNICIAN ______________ SNT-TC-1A LEVEL __________ DATE ______________

CLIENT REVIEW ______________ DATE ______________ PAGE ____ OF ____

Baker Inspection Group, LLC

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MATERIAL ____________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ____________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ____________________ Y-Axis ____________________

SURFACE CONDITION ____

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
									COMPONENT DRAWING NO.

TECHNICIAN ____________________ SNT-TC-1A LEVEL __________ DATE ____________

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Baker Inspection Group, LLC

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CLIENT PO# ______________ CLIENT JOB NO: ______________ INSTRUMENT TYPE/SN# ______________

INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. ______________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS _____ in. or SCHEDULE _______ DIAMETER _____ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________ Y-Axis ______________

SURFACE CONDITION ______________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
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COMPONENT DESCRIPTION ________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________ Y-Axis ________________

SURFACE CONDITION ________________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
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INST CAL. DATE ________ PROCEDURE _____ REV. ____ ACCEPTANCE STD. __________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS _____ in. or SCHEDULE _______ DIAMETER _____ in.

COMPONENT DESCRIPTION ______________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ______________ Y-Axis ______________

SURFACE CONDITION ______________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS

SKETCH:

COMPONENT DRAWING NO.

TECHNICIAN ______________ SNT-TC-1A LEVEL __________ DATE __________

CLIENT REVIEW ______________ DATE __________ PAGE ____ OF ____

Baker Inspection Group, LLC

ASME FLAW ULTRASONIC INSPECTION REPORT

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CLIENT: ________________ JOB LOCATION: ________________ JOB NO. __________

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INST CAL. DATE ______ PROCEDURE _____ REV. ____ ACCEPTANCE STD. ________ TEST SURFACE TEMP. ____ °F

MATERIAL ______________ THICKNESS ______ in. or SCHEDULE _______ DIAMETER ______ in.

COMPONENT DESCRIPTION ________________ TEST SURFACE __________ TIME START _____ TIME STOP _____

0 REFERENCE: X-Axis ________________ Y-Axis ________________

SURFACE CONDITION ________________

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
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MATERIAL ______________________ THICKNESS _____ in. or SCHEDULE ______ DIAMETER _____ in.

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0 REFERENCE: X-Axis ______________________ Y-Axis ______________________

SURFACE CONDITION ____

PART NO. OR WELD NO.	IND. NO.	MAX. % DAC	SOUND (BEAM) PATH (in.)	LOC. (X) (in.)	POS. (Y) (in.)	CAL. SHEET ID	ANGLE DEG. & (DIR.)	COMMENTS & STATUS	SKETCH:
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CLIENT REVIEW ______________________ DATE ______________ PAGE ____ OF ____

ENGINEERING & INSPECTIONS HAWAII, INC.

Attachment E

Spread sheet of data findings and repair recommendations

P. O. Box 700217 • Kapolei, HI 96709-0217 • Tel: (808) 682-1667 • Fax: (808) 682-1834 • E-Mail: E I Hawaii@aol.com

Red Hill Tank 20 API-653 Recommendation Summary

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
1	Lower Dome	A	1	1	Wall Loss (corner)	0.236	Based on remaining thickness; No action is required
2	Lower Dome	A	1	1	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
3	Lower Dome	A	1	3	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
4	Lower Dome	A	1	4	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
5	Lower Dome	A	1	6	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
6	Lower Dome	A	1	6	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
7	Lower Dome	A	1	6	Wall Loss	0.240	Based on remaining thickness; No action is required
8	Lower Dome	A	1	7	Wall Loss (around PP)	0.240	Based on remaining thickness; No action is required
9	Lower Dome	A	1	7	Wall Loss	0.240	Based on remaining thickness; No action is required
10	Lower Dome	A	1	7	Wall Loss	0.241	Based on remaining thickness; No action is required
11	Lower Dome	A	1	8	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
12	Lower Dome	A	1	8	Wall Loss	0.239	Based on remaining thickness; No action is required
13	Lower Dome	A	1	8	Wall Loss	0.241	Based on remaining thickness; No action is required
14	Lower Dome	A	1	8	Wall Loss	0.242	Based on remaining thickness; No action is required
15	Lower Dome	A	1	8	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
16	Lower Dome	A	1	8	Wall Loss (corner)	0.237	Based on remaining thickness; No action is required
17A/B	Lower Dome	A	1	9	Wall Loss (corner)	0.237/0.240	Based on remaining thickness; No action is required
18	Lower Dome	A	1	10	Wall Loss (corner)	0.238	Based on remaining thickness; No action is required
19	Lower Dome	A	1	10	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
20	Lower Dome	A	1	10	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
21	Lower Dome	A	1	10	Wall Loss (around Lug)	0.235	Based on remaining thickness; No action is required
22	Lower Dome	A	1	11	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
23	Lower Dome	A	1	11	Wall Loss (around PP)	0.237	Based on remaining thickness; No action is required
24	Lower Dome	A	1	11	Wall Loss (around pipe plate)	0.237	Based on remaining thickness; No action is required
25	Lower Dome	B	1	12	Wall Loss	0.242	Based on remaining thickness; No action is required
26	Lower Dome	B	1	12	Wall Loss (corner)	0.237	Based on remaining thickness; No action is required
27	Lower Dome	B	1	13	Wall Loss (corner)	0.234	Based on remaining thickness; No action is required
28	Lower Dome	B	1	13	Wall Loss (corner)	0.228	Based on remaining thickness; No action is required
29	Lower Dome	B	1	13	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
30	Lower Dome	B	1	13	Wall Loss (around pipe plate)	0.240	Based on remaining thickness; No action is required
31	Lower Dome	B	1	13	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required
32	Lower Dome	B	1	13	Wall Loss (corner)	0.239	Based on remaining thickness; No action is required
33	Lower Dome	B	1	14	Wall Loss	0.240	Based on remaining thickness; No action is required

Red Hill Tank 20 API-653 Recommendation Summary

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
34	Lower Dome	B	1	14	Wall Loss (corner)	0.235	Based on remaining thickness; No action is required		
35	Lower Dome	B	1	14	Wall Loss (around PP)	0.239	Based on remaining thickness; No action is required		
36	Lower Dome	B	1	14	Wall Loss (around pipe plate)	0.240	Based on remaining thickness; No action is required		
37	Lower Dome	B	1	14	Wall loss (corner)	0.240	Based on remaining thickness; No action is required		
38	Lower Dome	B	1	16	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required		
39	Lower Dome	B	1	21	Wall Loss (around diamond pl.)	0.244	Based on remaining thickness; No action is required		
40	Lower Dome	C	1	25	Wall Loss (around PP)	0.243	Based on remaining thickness; No action is required		
41	Lower Dome	C	1	25	Wall Loss (around pipe plate)	0.241	Based on remaining thickness; No action is required		
42	Lower Dome	C	1	28	Wall Loss (around bracket)	0.238	Based on remaining thickness; No action is required		
43	Lower Dome	C	1	30	Wall loss (PP)	0.238	Based on remaining thickness; No action is required		
44	Lower Dome	C	1	30	Wall Loss (corner)	0.239	Based on remaining thickness; No action is required		
45	Lower Dome	C	1	32	Wall Loss (around PP)	.237-.240	Based on remaining thickness; No action is required		
46	Lower Dome	D	1	37	Wall loss (PP)	0.240	Based on remaining thickness; No action is required		
47	Lower Dome	D	1	37-38	Weld Defect	LOF	Repair by Welding		
48	Lower Dome	D	1	38	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required		
49	Lower Dome	D	1	38	Wall Loss (around PP)	0.237	Based on remaining thickness; No action is required		
50	Lower Dome	D	1	38-39	Weld Defect	LOF	Repair by Welding		
51	Lower Dome	D	1	38-39	Weld Defect	LOF	Repair by Welding		
52	Lower Dome	D	1	39	Wall loss (PP)	0.230	Based on remaining thickness; No action is required		
53	Lower Dome	D	1	40	Wall Loss (corner)	0.240	Based on remaining thickness; No action is required		
54	Lower Dome	D	1	40	Wall Loss (around PP)	.238-.240	Based on remaining thickness; No action is required		
55	Lower Dome	D	1	42	Wall Loss	0.240	Based on remaining thickness; No action is required		
56	Lower Dome	D	1	43	Wall Loss (around PP)	0.240	Based on remaining thickness; No action is required		
57	Lower Dome	D	1	44	Wall Loss (around PP)	0.240	Based on remaining thickness; No action is required		
58	Lower Dome	D	2	43	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
59	Lower Dome	D	2	42	Grout Nozzle	0.230	Based on remaining thickness; No action is required		
60	Lower Dome	D	2	41	Grout Nozzle	0.198	Based on remaining thickness; No action is required		
61A/B	Lower Dome	D	2	39	Grout Nozzles	.208/.218	Based on remaining thickness; No action is required		
62	Lower Dome	D	2	38	Grout Nozzle	0.208	Based on remaining thickness; No action is required		
63	Lower Dome	D	2	37	Grout Nozzle	0.228	Based on remaining thickness; No action is required		
64	Lower Dome	D	2	36	Grout Nozzle	0.209	Based on remaining thickness; No action is required		
65	Lower Dome	C	2	33	Grout Nozzle	0.220	Based on remaining thickness; No action is required		
66	Lower Dome	C	2	32	Grout Nozzle	0.207	Based on remaining thickness; No action is required		
67	Lower Dome	C	2	30	Grout Nozzle	0.220	Based on remaining thickness; No action is required		

Red Hill Tank 20 API-653 Recommendation Summary

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
68	Lower Dome	C	2	29	Grout Nozzle	0.212	Based on remaining thickness; No action is required
69	Lower Dome	A	2	7	Grout Nozzle	0.200	Based on remaining thickness; No action is required
70	Lower Dome	A	2	8	Grout Nozzle	0.220	Based on remaining thickness; No action is required
71	Lower Dome	B	2	14	Grout Nozzle	0.212	Based on remaining thickness; No action is required
72	Lower Dome	B	2	15	Grout Nozzle	0.220	Based on remaining thickness; No action is required
73	Lower Dome	B	2	16	Grout Nozzle	0.215	Based on remaining thickness; No action is required
74	Lower Dome	B	2	18	Grout Nozzle	0.211	Based on remaining thickness; No action is required
75	Lower Dome	B	2	19	Grout Nozzle	0.208	Based on remaining thickness; No action is required
76	Lower Dome	B	2	19	Grout Nozzle	0.224	Based on remaining thickness; No action is required
77	Lower Dome	B	3	22	Grout Nozzle	0.230	Based on remaining thickness; No action is required
78	Lower Dome	B	3	22	Grout Nozzle	0.230	Based on remaining thickness; No action is required
79	Lower Dome	B	3	20	Grout Nozzle	0.224	Based on remaining thickness; No action is required
80	Lower Dome	B	3	17	Grout Nozzle	0.212	Based on remaining thickness; No action is required
81	Lower Dome	B	3	17	Grout Nozzle	0.220	Based on remaining thickness; No action is required
82	Lower Dome	B	4	25	Grout Nozzle	0.225	Based on remaining thickness; No action is required
83	Lower Dome	A	2	10	Grout Nozzle	0.236	Based on remaining thickness; No action is required
84	Lower Dome	B	2	20	Grout Nozzle	0.210	Based on remaining thickness; No action is required
85	Lower Dome	C	3	32	Grout Nozzle	0.207	Based on remaining thickness; No action is required
86	Lower Dome	C	3	31	Grout Nozzle	0.199	Based on remaining thickness; No action is required
87	Lower Dome	C	3	26	Grout Nozzle	0.216	Based on remaining thickness; No action is required
88	Lower Dome	C	3	25	Grout Nozzle	0.211	Based on remaining thickness; No action is required
89A/B	Lower Dome	C	3	23	Grout Nozzles	.207/.217	Based on remaining thickness; No action is required
90	Lower Dome	C	2	23	Grout Nozzle	0.219	Based on remaining thickness; No action is required
91	Lower Dome	C	2	24	Grout Nozzle	0.210	Based on remaining thickness; No action is required
92	Lower Dome	C	2	25	Grout Nozzle	0.213	Based on remaining thickness; No action is required
93	Lower Dome	C	3	28	Grout Nozzle	0.216	Based on remaining thickness; No action is required
94	Lower Dome	C	3	26	Grout Nozzle	0.187	Based on remaining thickness; No action is required
95	Lower Dome	B	4	31	Grout Nozzle	0.215	Based on remaining thickness; No action is required
96	Lower Dome	B	3	22	Grout Nozzle	0.230	Based on remaining thickness; No action is required
97	Lower Dome	B	3	14	Grout Nozzle	0.220	Based on remaining thickness; No action is required
98	Lower Dome	A	3	10	Grout Nozzle	0.219	Based on remaining thickness; No action is required
99	Lower Dome	A	3	9	Grout Nozzle	0.198	Based on remaining thickness; No action is required
100	Lower Dome	A	4	13	Grout Nozzle	0.219	Based on remaining thickness; No action is required
101	Lower Dome	A	4	11	Grout Nozzle	0.222	Based on remaining thickness; No action is required
102	Lower Dome	A	3	6	Grout Nozzle	0.223	Based on remaining thickness; No action is required

Red Hill Tank 20 API-653 Recommendation Summary

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
103	Lower Dome	A	3	6	Grout Nozzle	0.223	Based on remaining thickness; No action is required
104	Lower Dome	A	3	8	Grout Nozzle	0.230	Based on remaining thickness; No action is required
105	Lower Dome	A	3	6	Grout Nozzle	0.213	Based on remaining thickness; No action is required
106	Lower Dome	A	3	5	Grout Nozzle	0.222	Based on remaining thickness; No action is required
107	Lower Dome	A	4	7	Grout Nozzle	0.214	Based on remaining thickness; No action is required
108	Lower Dome	A	3	4	Grout Nozzle	0.215	Based on remaining thickness; No action is required
109	Lower Dome	A	3	5	Grout Nozzle	0.224	Based on remaining thickness; No action is required
110	Lower Dome	A	4	5	Grout Nozzle	0.220	Based on remaining thickness; No action is required
111	Lower Dome	D	4	65	Grout Nozzle	0.228	Based on remaining thickness; No action is required
112	Lower Dome	C	4	46	Grout Nozzle	0.201	Based on remaining thickness; No action is required
113	Lower Dome	B	3	22	Wall Loss	0.232	Based on remaining thickness; No action is required
114	Lower Dome	C	4	40	Grout Nozzle	0.212	Based on remaining thickness; No action is required
115A/B	Lower Dome	C	3	30	Grout Nozzles	0.228/.207	Based on remaining thickness; No action is required
116	Lower Dome	C	3	29	Grout Nozzle	0.210	Based on remaining thickness; No action is required
117	Lower Dome	C	3	28	Grout Nozzle	0.216	Based on remaining thickness; No action is required
118	Lower Dome	C	3	27	Pitting	0.233	Based on remaining thickness; No action is required
119	Lower Dome	C	3	27	Grout Nozzle	0.205	Based on remaining thickness; No action is required
120	Lower Dome	D	4	48	Grout Nozzle	0.211	Based on remaining thickness; No action is required
121	Lower Dome	D	3	34	Grout Nozzle	0.200	Based on remaining thickness; No action is required
122	Lower Dome	D	3	34	Grout Nozzle	0.215	Based on remaining thickness; No action is required
123	Lower Dome	D	3	35	Grout Nozzle	0.200	Based on remaining thickness; No action is required
124	Lower Dome	D	3	36	Grout Nozzle	0.219	Based on remaining thickness; No action is required
125	Lower Dome	D	4	54	Grout Nozzle	0.212	Based on remaining thickness; No action is required
126	Lower Dome	D	3	37	Grout Nozzle	0.213	Based on remaining thickness; No action is required
127	Lower Dome	D	3	39	Grout Nozzle	0.204	Based on remaining thickness; No action is required
128	Lower Dome	D	3	39	Grout Nozzle	0.212	Based on remaining thickness; No action is required
129	Lower Dome	D	4	56	Grout Nozzle	0.213	Based on remaining thickness; No action is required
130	Lower Dome	D	4	59	Grout Nozzle	0.207	Based on remaining thickness; No action is required
131	Lower Dome	D	3	40	Grout Nozzle	0.212	Based on remaining thickness; No action is required
132	Lower Dome	D	4	62	Grout Nozzle	0.205	Based on remaining thickness; No action is required
133	Lower Dome	D	3	41	Grout Nozzle	0.210	Based on remaining thickness; No action is required
134	Lower Dome	D	3	43	Grout Nozzle	0.224	Based on remaining thickness; No action is required
135	Lower Dome	D	3	44	Grout Nozzle	0.228	Based on remaining thickness; No action is required
136	Lower Dome	D	3	44	Grout Nozzle	0.224	Based on remaining thickness; No action is required
137	Barrel	D	26	16	Dent		No Action Required

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
138	Barrel	D	5	16	Grout Nozzle	0.196	Based on remaining thickness; No action is required		
139	Barrel	D	19	16	Grout Nozzle	0.218	Based on remaining thickness; No action is required		
140	Barrel	A	12	2	Grout Nozzle	0.219	Based on remaining thickness; No action is required		
141	Barrel	A	12	3	Grout Nozzle	0.204	Based on remaining thickness; No action is required		
142	Barrel	D	12	14	Grout Nozzle	0.138	Based on remaining thickness; No action is required		
143	Barrel	A	27	3	Grout Nozzle	0.202	Based on remaining thickness; No action is required		
144	Barrel	D	1	14	Grout Nozzle	0.208	Based on remaining thickness; No action is required		
145	Barrel	D	5	14	Grout Nozzle	0.204	Based on remaining thickness; No action is required		
146	Barrel	A	11	1	Weld Defect	LOF	Repair by Welding		
147	Barrel	A	12	1	Grout Nozzle	0.230	Based on remaining thickness; No action is required		
148	Barrel	D	19	14	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
149	Barrel	D	27	14	Grout Nozzle	0.207	Based on remaining thickness; No action is required		
150	Barrel	D	12	13	Grout Nozzle	0.202	Based on remaining thickness; No action is required		
151	Barrel	D	19	13a	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
152	Barrel	A	19	4	Grout Nozzle	0.230	Based on remaining thickness; No action is required		
153	Barrel	A	C	4b	Grout Nozzle	0.224	Based on remaining thickness; No action is required		
154	Barrel	C	1	12	Grout Nozzle	0.204	Based on remaining thickness; No action is required		
155	Barrel	D	5	13	Grout Nozzle	0.207	Based on remaining thickness; No action is required		
156	Barrel	C	12	12	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
157	Barrel	D	27	12	Grout Nozzle	0.204	Based on remaining thickness; No action is required		
158	Barrel	D	4	12	Grout Nozzle	0.197	Based on remaining thickness; No action is required		
159	Barrel	C	19	12	Grout Nozzle	0.197	Based on remaining thickness; No action is required		
160	Barrel	B	27	5	Grout Nozzle	0.221	Based on remaining thickness; No action is required		
161	Barrel	B	12	5	Grout Nozzle	0.221	Based on remaining thickness; No action is required		
162	Barrel	C	1	10	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
163	Barrel	C	5	10	Grout Nozzle	0.204	Based on remaining thickness; No action is required		
164	Barrel	C	12	10	Grout Nozzle	0.207	Based on remaining thickness; No action is required		
165	Barrel	C	15	11	Pitting	0.231	Based on remaining thickness; No action is required		
166	Barrel	C	23	10	Gouge		Repair by Welding		
167	Barrel	C	19	10	Grout Nozzle	0.204	Based on remaining thickness; No action is required		
168	Barrel	A	12	4	Grout Nozzle	0.213	Based on remaining thickness; No action is required		
169	Barrel	A	1	5	Grout Nozzle	0.219	Based on remaining thickness; No action is required		
170	Barrel	A	19	5	Grout Nozzle	0.224	Based on remaining thickness; No action is required		
171	Barrel	A	17	4	NRI	NRI			
172	Barrel	B	19	7	Grout Nozzle	0.229	Based on remaining thickness; No action is required		

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
173	Barrel	B	28	7	Gouge		Repair by Welding
174	Barrel	B	22	6	Weld Defect	LOF	Repair by Welding
175	Barrel	B	5	7	Grout Nozzle	0.230	Based on remaining thickness; No action is required
176	Barrel	C	27	11	Grout Nozzle	0.214	Based on remaining thickness; No action is required
177	Barrel	C	12	9	Grout Nozzle	0.204	Based on remaining thickness; No action is required
178	Barrel	C	1	9	Grout Nozzle	0.211	Based on remaining thickness; No action is required
179	Barrel	C	5	9	Grout Nozzle	0.209	Based on remaining thickness; No action is required
180	Barrel	B	27	8	Grout Nozzle	0.203	Based on remaining thickness; No action is required
181	Barrel	C	12	8	Grout Nozzle	0.222	Based on remaining thickness; No action is required
182	Barrel	C	19	9A	Grout Nozzle	0.213	Based on remaining thickness; No action is required
183	Deleted from program						
184	Exp Joint	C	2	24	Grout Nozzle	0.207	Based on remaining thickness; No action is required
185	Exp Joint	C	2	24	Grout Nozzle	0.208	Based on remaining thickness; No action is required
186	Exp Joint	C	2	24	Grout Nozzle	0.220	Based on remaining thickness; No action is required
187	Exp Joint	C	2	25	Grout Nozzle	0.227	Based on remaining thickness; No action is required
188	Exp Joint	C	2	25	Grout Nozzle	0.223	Based on remaining thickness; No action is required
189	Exp Joint	C	2	26	Grout Nozzle	0.200	Based on remaining thickness; No action is required
190	Exp Joint	C	2	27	Grout Nozzle	0.208	Based on remaining thickness; No action is required
191	Exp Joint	C	2	27	Grout Nozzle	0.217	Based on remaining thickness; No action is required
192	Exp Joint	C	2	28	Grout Nozzle	0.199	Based on remaining thickness; No action is required
193	Exp Joint	C	2	28	Grout Nozzle	0.200	Based on remaining thickness; No action is required
194	Exp Joint	C	2	28	Grout Nozzle	0.217	Based on remaining thickness; No action is required
195	Exp Joint	C	2	29	Grout Nozzle	0.210	Based on remaining thickness; No action is required
196	Exp Joint	C	2	30	Grout Nozzle	0.200	Based on remaining thickness; No action is required
197	Exp Joint	C	2	30	Grout Nozzle	0.192	Based on remaining thickness; No action is required
198	Exp Joint	C	2	30	Dent		No Action Required
199	Exp Joint	C	2	31	Grout Nozzle	0.219	Based on remaining thickness; No action is required
200	Exp Joint	C	2	31	Grout Nozzle	0.204	Based on remaining thickness; No action is required
201	Exp Joint	C	2	32	Grout Nozzle	0.211	Based on remaining thickness; No action is required
202	Exp Joint	C	2	33	Grout Nozzle	0.211	Based on remaining thickness; No action is required
203	Exp Joint	C	2	33	Grout Nozzle	0.211	Based on remaining thickness; No action is required
204	Exp Joint	C	2	34	Grout Nozzle	0.214	Based on remaining thickness; No action is required
205	Exp Joint	C	2	34	Grout Nozzle	0.210	Based on remaining thickness; No action is required
206	Exp Joint	C	2	35	Grout Nozzle	0.195	Based on remaining thickness; No action is required
207	Exp Joint	C	2	35	Grout Nozzle	0.205	Based on remaining thickness; No action is required

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
208	Exp Joint	C	2	35	Grout Nozzle	0.213	Based on remaining thickness; No action is required
209	Exp Joint	D	2	36	Grout Nozzle	0.193	Based on remaining thickness; No action is required
210	Exp Joint	D	2	37	Grout Nozzle	0.213	Based on remaining thickness; No action is required
211	Exp Joint	D	2	37	Grout Nozzle	0.200	Based on remaining thickness; No action is required
212	Exp Joint	D	2	37	Weld Defect	LOF	Repair by Welding
213	Exp Joint	B	1	11	Grout Nozzle	0.205	Based on remaining thickness; No action is required
214	Exp Joint	C	1	12	Grout Nozzle	0.207	Based on remaining thickness; No action is required
215	Exp Joint	C	3	20	Gouge		Repair by Welding
216	Exp Joint	C	4	10	Patch Plate	0.230	Based on remaining thickness; No action is required
217	Barrel	B	5	8	Grout Nozzle	0.194	Based on remaining thickness; No action is required
218	Barrel	B	19	8	Grout Nozzle	0.230	Based on remaining thickness; No action is required
219	Barrel	B	27	8	Weld Defect	LOF	Repair by Welding
220	Barrel	B	27	8	General Corrosion	0.230	Based on remaining thickness; No action is required
221	Exp Joint	A	2	3	Gouge		Repair by Welding
222	Exp Joint	A	1	4	Grout Nozzle	0.230	Based on remaining thickness; No action is required
223	Exp Joint	A	1	5	Square Plate	0.230	Based on remaining thickness; No action is required
224	Exp Joint	B	1	6	Grout Nozzle	0.236	Based on remaining thickness; No action is required
225	Exp Joint	B	1	8	Grout Nozzle	0.232	Based on remaining thickness; No action is required
226	Exp Joint	B	2	23	Grout Nozzle	0.208	Based on remaining thickness; No action is required
227	Exp Joint	B	2	23	Gouge		Repair by Welding
228	Exp Joint	B	2	22	Grout Nozzle	0.209	Based on remaining thickness; No action is required
229	Exp Joint	B	2	22	Grout Nozzle	0.229	Based on remaining thickness; No action is required
230	Exp Joint	B	2	22	Grout Nozzle	0.236	Based on remaining thickness; No action is required
231	Exp Joint	B	2	21	Grout Nozzle	0.226	Based on remaining thickness; No action is required
232	Exp Joint	B	2	21	Grout Nozzle	0.219	Based on remaining thickness; No action is required
233	Exp Joint	B	2	20	Grout Nozzle	0.224	Based on remaining thickness; No action is required
234	Exp Joint	B	2	20	Grout Nozzle	0.240	Based on remaining thickness; No action is required
235	Exp Joint	B	2	20	Grout Nozzle	0.219	Based on remaining thickness; No action is required
236	Exp Joint	B	2	18	Grout Nozzle	0.209	Based on remaining thickness; No action is required
237	Exp Joint	B	2	19	Grout Nozzle	0.212	Based on remaining thickness; No action is required
238	Exp Joint	D	1	19	Grout Nozzle	0.205	Based on remaining thickness; No action is required
239	Exp Joint	C	1	13	Grout Nozzle	0.211	Based on remaining thickness; No action is required
240	Exp Joint	D	1	15	Grout Nozzle	0.221	Based on remaining thickness; No action is required
241	Exp Joint	D	4	16	Patch Plate	0.225	Based on remaining thickness; No action is required
242	Exp Joint	D	2	47	Grout Nozzle	0.200	Based on remaining thickness; No action is required

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
243	Exp Joint	D	2	45	Grout Nozzle	0.211	Based on remaining thickness; No action is required		
244	Exp Joint	D	2	46	Grout Nozzle	0.202	Based on remaining thickness; No action is required		
245	Exp Joint	D	2	46	Grout Nozzle	0.211	Based on remaining thickness; No action is required		
246	Exp Joint	D	2	43	Grout Nozzle	0.197	Based on remaining thickness; No action is required		
247	Exp Joint	D	2	44	NRI	NRI			
248	Exp Joint	D	3	35	NRI	NRI			
249	Exp Joint	D	2	42	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
250	Exp Joint	D	2	42	Grout Nozzle	0.209	Based on remaining thickness; No action is required		
251	Exp Joint	D	2	42	Grout Nozzle	0.215	Based on remaining thickness; No action is required		
252	Exp Joint	D	2	40	Grout Nozzle	0.214	Based on remaining thickness; No action is required		
253	Exp Joint	D	2	40	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
254	Exp Joint	D	2	40	Grout Nozzle	0.203	Based on remaining thickness; No action is required		
255	Exp Joint	D	2	40	Dent		No Action Required		
256	Exp Joint	D	2	41	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
257	Exp Joint	D	2	41	Grout Nozzle	0.214	Based on remaining thickness; No action is required		
258	Exp Joint	D	4	13	Weld Defect	LOF	Repair by Welding		
259	Exp Joint	D	2	39	Grout Nozzle	0.200	Based on remaining thickness; No action is required		
260	Exp Joint	D	2	37	Grout Nozzle	0.203	Based on remaining thickness; No action is required		
261	Exp Joint	D	2	38	Grout Nozzle	0.209	Based on remaining thickness; No action is required		
262	Exp Joint	D	2	38	Grout Nozzle	0.205	Based on remaining thickness; No action is required		
263	Exp Joint	D	2	38	Dent		No Action Required		
264	Upper Dome	D	A	54	Dent		No Action Required		
265	Upper Dome	D	A	66	Dent		No Action Required		
266	Upper Dome	D	A	56	Weld Defect	LOF	Repair by Welding		
267	Exp Joint	B	2	19	Weld Defect	Pitting	Repair by Welding		
268	Exp Joint	B	2	16	NRI	NRI			
269	Exp Joint	B	2	16	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
270	Exp Joint	B	2	17	Grout Nozzle	0.217	Based on remaining thickness; No action is required		
271	Exp Joint	B	2	17	Grout Nozzle	0.215	Based on remaining thickness; No action is required		
272	Exp Joint	B	2	17	Grout Nozzle	0.196	Based on remaining thickness; No action is required		
273	Exp Joint	B	2	15	Grout Nozzle	0.217	Based on remaining thickness; No action is required		
274	Exp Joint	B	2	15	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
275	Exp Joint	B	2	15	Grout Nozzle	0.219	Based on remaining thickness; No action is required		
276	Exp Joint	B	3	10	Gouge		Repair by Welding		
277	Exp Joint	B	3	10	Weld Defect	LOF	Repair by Welding		

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
278	Exp Joint	B	3	10	Weld Defect	LOF	Repair by Welding
279	Exp Joint	B	2	14	Grout Nozzle	0.237	Based on remaining thickness; No action is required
280	Exp Joint	B	2	14	Grout Nozzle	0.235	Based on remaining thickness; No action is required
281	Exp Joint	A	2	4	Grout Nozzle	0.208	Based on remaining thickness; No action is required
282	Exp Joint	A	2	4	Grout Nozzle	0.206	Based on remaining thickness; No action is required
283	Exp Joint	A	2	5	Grout Nozzle	0.195	Based on remaining thickness; No action is required
284	Exp Joint	A	2	5	Grout Nozzle	0.194	Based on remaining thickness; No action is required
285	Exp Joint	A	2	5	Grout Nozzle	0.208	Based on remaining thickness; No action is required
286	Exp Joint	A	2	6	Grout Nozzle	0.198	Based on remaining thickness; No action is required
287	Exp Joint	A	2	8	Grout Nozzle	0.216	Based on remaining thickness; No action is required
288	Exp Joint	A	2	8	Grout Nozzle	0.215	Based on remaining thickness; No action is required
289	Exp Joint	A	2	10	Grout Nozzle	0.224	Based on remaining thickness; No action is required
290	Exp Joint	A	2	10	Grout Nozzle	0.228	Based on remaining thickness; No action is required
291	Exp Joint	A	2	10	Grout Nozzle	0.208	Based on remaining thickness; No action is required
292	Exp Joint	A	2	12	Grout Nozzle	0.210	Based on remaining thickness; No action is required
293	Exp Joint	A	2	7	Grout Nozzle	0.202	Based on remaining thickness; No action is required
294	Exp Joint	A	2	7	Grout Nozzle	0.219	Based on remaining thickness; No action is required
295	Exp Joint	A	2	7	Grout Nozzle	0.194	Based on remaining thickness; No action is required
296	Exp Joint	A	2	9	Grout Nozzle	0.218	Based on remaining thickness; No action is required
297	Exp Joint	A	2	11	Grout Nozzle	0.197	Based on remaining thickness; No action is required
298	Exp Joint	A	2	11	Grout Nozzle	0.208	Based on remaining thickness; No action is required
299	Exp Joint	B	2	13	Grout Nozzle	0.222	Based on remaining thickness; No action is required
300	Exp Joint	B	2	13	Grout Nozzle	0.219	Based on remaining thickness; No action is required
301	Exp Joint	B	2	13	Grout Nozzle	0.215	Based on remaining thickness; No action is required
302	Upper Dome	D	A	57	Weld Defect	LOF	Repair by Welding
303	Upper Dome	D	A	60	Weld Defect	LOF	Repair by Welding
304	Upper Dome	D	A	59	Loss of Wall	0.165	Repair by use of Lap Welded Patch
305	Upper Dome	D	A	69	Weld Defect	LOF	Repair by Welding
306	Upper Dome	D	A	69	Grout Nozzle	0.200	Based on remaining thickness; No action is required
307	Upper Dome	D	A	69	NRI	NRI	
308	Upper Dome	D	A	57	Grout Nozzle	0.211	Based on remaining thickness; No action is required
309	Upper Dome	D	A	63	Grout Nozzle	0.213	Based on remaining thickness; No action is required
310	Upper Dome	C	A	45	Grout Nozzle	0.203	Based on remaining thickness; No action is required
311	Upper Dome	C	A	51	Grout Nozzle	0.225	Based on remaining thickness; No action is required
312	Upper Dome	C	A	37	Weld Defect	LOF	Repair by Welding

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
313	Upper Dome	C	A	37	Weld Defect	LOF	Repair by Welding		
314	Upper Dome	C	A	44	Weld Defect	LOF	Repair by Welding		
315	Upper Dome	C	A	43	Dent		No Action Required		
316	Upper Dome	A	A	39	Grout Nozzle	0.200	Based on remaining thickness; No action is required		
317	Upper Dome	A	A	39	Dent		No Action Required		
318	Upper Dome	A	A	15	Grout Nozzle	0.230	Based on remaining thickness; No action is required		
319	Upper Dome	A	A	21	Grout Nozzle	0.206	Based on remaining thickness; No action is required		
320	Upper Dome	A	A	8	NRI	NRI			
321	Upper Dome	A	A	9	Grout Nozzle	0.217	Based on remaining thickness; No action is required		
322	Exp Joint	A	3	4	Underside corrosion	0.220	Based on remaining thickness; No action is required		
323	Exp Joint	A	3	4	Underside corrosion	0.230	Based on remaining thickness; No action is required		
324	Exp Joint	A	3	4	Underside corrosion	0.220	Based on remaining thickness; No action is required		
325	Upper Dome	A	A	P10	Wall Loss	0.137	Repair by use of Lap Welded Patch		
326	Upper Dome	A	A	P11	Patch Plate	0.198	Based on remaining thickness; No action is required		
327	Exp Joint	A	2	3	Grout Nozzle	0.201	Based on remaining thickness; No action is required		
328	Exp Joint	A	2	3	Dent		No Action Required		
329	Exp Joint	A	2	3	Arc Gouge	0.160	Repair by Welding		
330	Exp Joint	A	2	3	Arc Gouge	0.160	Repair by Welding		
331	Exp Joint	B	2	13	Grout Nozzle	0.222	Based on remaining thickness; No action is required		
332	Exp Joint	B	2	13	Grout Nozzle	0.219	Based on remaining thickness; No action is required		
333	Exp Joint	B	2	13	Grout Nozzle	0.215	Based on remaining thickness; No action is required		
334	Exp Joint	A	2	7	Underside corrosion	0.137	Repair by use of Lap Welded Patch		
335	Exp Joint	A	3	5	Underside corrosion	0.208	Based on remaining thickness; No action is required		
336	Upper Dome	C	B	36	Grout Nozzle	0.197	Based on remaining thickness; No action is required		
337	Upper Dome	C	B	42	Weld Defect	LOF	Repair by Welding		
338	Upper Dome	D	B	66	Grout Nozzle	0.217	Based on remaining thickness; No action is required		
339	Upper Dome	D	B	60	Grout Nozzle	0.218	Based on remaining thickness; No action is required		
340	Upper Dome	D	B	57	Dent		No Action Required		
341	Upper Dome	D	B	53	Weld Defect	LOF	Repair by Welding		
342	Upper Dome	D	B	54	Grout Nozzle	0.206	Based on remaining thickness; No action is required		
343	Upper Dome	C	B	48	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
344	Upper Dome	C	B	42	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
345	Upper Dome	C	B	39	Weld Defect	LOF	Repair by Welding		
346	Upper Dome	C	B	47	Weld Defect	LOF	Repair by Welding		
347	Upper Dome	C	B	48	Through Hole		Repair by Welding		

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
348	Upper Dome	C	B	51	NRI	NRI			
349	Upper Dome	B	B	31	Dent		No Action Required		
350	Upper Dome	B	B	24	Grout Nozzle	0.221	Based on remaining thickness; No action is required		
351	Upper Dome	B	B	29	Arc Gouge	0.160	Repair by Welding		
352	Upper Dome	B	B	29	Arc Gouge	0.160	Repair by Welding		
353	Upper Dome	B	B	19	Arc Gouge	0.160	Repair by Welding		
354	Upper Dome	B	B	22	NRI	NRI			
355	Upper Dome	A	B	6	Grout Nozzle	0.214	Based on remaining thickness; No action is required		
356	Upper Dome	A	B	12	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
357	Upper Dome	A	A	15	Pitting	0.188	Based on remaining thickness; No action is required		
358	Upper Dome	A	B	16	Weld Defect	LOF	Repair by Welding		
359	Upper Dome	B	A	32	Weld Defect	LOF	Repair by Welding		
360	Upper Dome	B	A	18	Weld Defect	LOF	Repair by Welding		
361	Upper Dome	B	A	33	Grout Nozzle	0.209	Based on remaining thickness; No action is required		
362	Upper Dome	B	A	33	Weld Defect	LOF	Repair by Welding		
363	Upper Dome	B	A	33	Weld Defect	LOF	Repair by Welding		
364	Upper Dome	B	B	30	Weld Defect	LOF	Repair by Welding		
365	Upper Dome	B	B	30	Weld Defect	LOF	Repair by Welding		
366	Upper Dome	B	B	30	Weld Defect	LOF	Repair by Welding		
367	Upper Dome	B	B	30	Gouge	0.113	Repair by Welding		
368	Upper Dome	B	B	30	Grout Nozzle	0.217	Based on remaining thickness; No action is required		
369	Upper Dome	B	A	29	Pitting		Repair by Welding		
370	Upper Dome	B	A	31	NRI	NRI			
371	Exp Joint	A	2	7	Grout Nozzle	0.202	Based on remaining thickness; No action is required		
372	Exp Joint	A	2	7	Grout Nozzle	0.194	Based on remaining thickness; No action is required		
373	Exp Joint	A	2	7	Grout Nozzle	0.219	Based on remaining thickness; No action is required		
374	Upper Dome	B	A	27	Grout Nozzle	0.214	Based on remaining thickness; No action is required		
375	Upper Dome	B	A	35	Weld Defect	LOF	Repair by Welding		
376	Upper Dome	A	C	4	Wall Loss	0.230	Based on remaining thickness; No action is required		
377	Upper Dome	A	B	8	Weld Defect	LOF	Repair by Welding		
378	Upper Dome	A	C	8	Weld Defect	LOF	Repair by Welding		
379	Upper Dome	A	B	14	Weld Defect	LOF	Repair by Welding		
380	Upper Dome	A	B	17	Weld Defect	LOF	Repair by Welding		
381	Upper Dome	A	B	18	Weld Defect	LOF	Repair by Welding		
382	Upper Dome	B	C	17	Weld Defect	LOF	Repair by Welding		

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Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
383	Upper Dome	B	C	17	Weld Defect	LOF	Repair by Welding		
384	Upper Dome	B	B	35	Weld Defect	LOF	Repair by Welding		
385	Upper Dome	B	B	35	Weld Defect	LOF	Repair by Welding		
386	Upper Dome	B	C	23	Grout Nozzle	0.180	Based on remaining thickness; No action is required		
387	Upper Dome	B	C	23	Dent		No Action Required		
388	Upper Dome	B	C	23	Dent		No Action Required		
389	Upper Dome	B	C	20	Gouge		Repair by Welding		
390	Upper Dome	B	C	18	Grout Nozzle	0.208	Based on remaining thickness; No action is required		
391	Upper Dome	A	C	11	Grout Nozzle	0.220	Based on remaining thickness; No action is required		
392	Upper Dome	A	B	14	Weld Defect	LOF	Repair by Welding		
393	Upper Dome	A	B	17	Weld Defect	LOF	Repair by Welding		
394	Upper Dome	D	C	46	Weld Defect	LOF	Repair by Welding		
395	Upper Dome	D	C	46	Weld Defect	LOF	Repair by Welding		
396	Upper Dome	D	C	46	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
397	Upper Dome	D	C	44	Weld Defect	LOF	Repair by Welding		
398	Upper Dome	D	C	38	Grout Nozzle	0.220	Based on remaining thickness; No action is required		
399	Upper Dome	D	C	43	Grout Nozzle	0.220	Based on remaining thickness; No action is required		
400	Upper Dome	D	C	43	NRI	NRI			
401	Upper Dome	C	C	33	Weld Defect	LOF	Repair by Welding		
402	Upper Dome	D	C	35	Grout Nozzle	0.229	Based on remaining thickness; No action is required		
403	Upper Dome	C	C	30	Dent		No Action Required		
404	Upper Dome	C	C	30	Grout Nozzle	0.218	Based on remaining thickness; No action is required		
405	Upper Dome	C	C	26	Grout Nozzle	0.218	Based on remaining thickness; No action is required		
406	Upper Dome	C	C	40	Weld Defect	LOF	Repair by Welding		
407	Upper Dome	C	C	34	Weld Defect	LOF	Repair by Welding		
408	Upper Dome	C	C	34	Weld Defect	LOF	Repair by Welding		
409	Upper Dome	A	C	13	Weld Defect	LOF	Repair by Welding		
410	Upper Dome	B	C	15	Grout Nozzle	0.190	Based on remaining thickness; No action is required		
411	Upper Dome	B	B	18	Grout Nozzle	0.210	Based on remaining thickness; No action is required		
412	Upper Dome	A	C	6	Grout Nozzle	0.225	Based on remaining thickness; No action is required		
413	Upper Dome	A	C	11	Weld Defect	LOF	Repair by Welding		
414	Upper Dome	A	C	6	Weld Defect	LOF	Repair by Welding		
415	Upper Dome	B	C	21	Gouge	0.113	Repair by Welding		
416	Upper Dome	C	C	12	Pitting	0.161	Repair by Welding		
417	Upper Dome	C	C	29	Weld Defect	LOF	Repair by Welding		

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation
418	Upper Dome	A	C	29	Grout Nozzle	0.236	Based on remaining thickness; No action is required
419	Upper Dome	A	B	3	Dent		No Action Required
420	Upper Dome	A	A	3	Grout Nozzle	0.230	Based on remaining thickness; No action is required
421	Upper Dome	D	D	48	Weld Defect	LOF	Repair by Welding
422	Upper Dome	D	D	44	Grout Nozzle	0.200	Based on remaining thickness; No action is required
423	Upper Dome	D	D	39	Weld Defect	LOF	Repair by Welding
424	Deleted from program						
425	Upper Dome	D	D	41	Grout Nozzle	0.206	Based on remaining thickness; No action is required
426	Upper Dome	C	D	35	Gouge		Repair by Welding
427	Upper Dome	C	D	36	Grout Nozzle	0.200	Based on remaining thickness; No action is required
428	Upper Dome	C	D	29	Grout Nozzle	0.204	Based on remaining thickness; No action is required
429	Upper Dome	C	D	32	Grout Nozzle	0.205	Based on remaining thickness; No action is required
430	Upper Dome	C	D	30	Dent		No Action Required
431	Upper Dome	D	D	25	Grout Nozzle	0.223	Based on remaining thickness; No action is required
432	Upper Dome	D	E	20	Weld Defect	LOF	Repair by Welding
433	Upper Dome	D	E	20	Weld Defect	LOF	Repair by Welding
434	Upper Dome	D	E	20	Weld Defect	LOF	Repair by Welding
435	Upper Dome	D	E	20	Weld Defect	LOF	Repair by Welding
436	Upper Dome	C	E	16	Weld Defect	LOF	Repair by Welding
437	Upper Dome	B	D	16	Weld Defect	LOF	Repair by Welding
438	Upper Dome	B	D	16	Grout Nozzle	0.220	Based on remaining thickness; No action is required
439	Upper Dome	B	D	17	Weld Defect	LOF	Repair by Welding
440	Upper Dome	A	C	6	Grout Nozzle	0.230	Based on remaining thickness; No action is required
441	Upper Dome	B	D	24	Weld Defect	LOF	Repair by Welding
442	Upper Dome	B	D	21	Weld Defect	LOF	Repair by Welding
443	Upper Dome	A	D	9	Grout Nozzle	0.210	Based on remaining thickness; No action is required
444	Upper Dome	A	D	5	Grout Nozzle	0.205	Based on remaining thickness; No action is required
445	Upper Dome	B	D	13	Grout Nozzle	0.210	Based on remaining thickness; No action is required
446	Upper Dome	B	D	22	Dent		No Action Required
447	Upper Dome	B	E	10	Weld Defect	LOF	Repair by Welding
448	Upper Dome	B	D	21	Grout Nozzle	0.215	Based on remaining thickness; No action is required
449	Upper Dome	B	D	21	Weld Defect	LOF	Repair by Welding
450	Upper Dome	D	D	43	Dent		No Action Required
451	Upper Dome	C	C	40	Weld Defect	LOF	Repair by Welding
452	Upper Dome	C	D	32	Weld Defect	LOF	Repair by Welding

Red Hill Tank 20 API-653 Recommendation Summary

Flaw No.	Tank Section	Quad	Row/Course	Plate	Description of Flaw	R. Thickness	API-653 Recommendation		
453	Upper Dome	C	D	32	Weld Defect	LOF	Repair by Welding		
454	Upper Dome	D	D	47	Dent		No Action Required		
455	Upper Dome	B	D	15	Weld Defect	LOF	Repair by Welding		
456	Lower Dome	A	2	2	Grout Nozzle	0.212	Based on remaining thickness; No action is required		
457	Lower Dome	A	4	2	Grout Nozzle	0.230	Based on remaining thickness; No action is required		
458	Lower Dome	A	3	1	Grout Nozzle	0.200	Based on remaining thickness; No action is required		
459	Barrel	A	5	1	Grout Nozzle	0.220	Based on remaining thickness; No action is required		
460	Barrel	A	1	1	Grout Nozzle	0.209	Based on remaining thickness; No action is required		
461	Barrel	D	12	16	Grout Nozzle	0.211	Based on remaining thickness; No action is required		
462	Barrel	D	19	16	Grout Nozzle	0.216	Based on remaining thickness; No action is required		
463	Barrel	D	26	1	Weld Defect	LOF	Repair by Welding		
464	Barrel	D	27	1	Grout Nozzle	0.205	Based on remaining thickness; No action is required		
465	Extension	A	2	1	NRI				
466	Barrel	D	26	16	NRI				
467	Barrel	D	26	16	Weld Defect	LOF	Repair by Welding		
468	Catwalk	A	3	2	Weld Defect	LOF	Repair by Welding		
469	Manway	A	3		Weld Defect	LOF	Repair by Welding		
470	Upper Dome	A	A	8	Weld Defect	LOF	Repair by Welding		
471	Upper Dome	B	A	31	Weld Defect	LOF	Repair by Welding		
472	Upper Dome	B	B	20	Weld Defect	LOF	Repair by Welding		
473	Upper Dome	B	B	20	Weld Defect	LOF	Repair by Welding		
474	Upper Dome	A	C	1	Weld Defect	LOF	Repair by Welding		
475	Upper Dome	A	C	3	Weld Defect	LOF	Repair by Welding		
476	Extension	D	4	39	Weld Defect	LOF	Repair by Welding		
477	Upper Dome	A	A	17	Weld Defect	LOF	Repair by Welding		
478	Upper Dome	D	A	65	Weld Defect	LOF	Repair by Welding		
479	Upper Dome	D	A	66	Gouge	0.085	Repair by Welding		
480	Upper Dome	D	C	38	Weld Defect	LOF	Repair by Welding		
481	Upper Dome	B	C	20	Weld Defect	LOF	Repair by Welding		
482	**Lower Dome**	**B**	**1**	**13-Dec**	**Crack**	**Crack**	**Repair by Welding**		

ENGINEERING & INSPECTIONS
HAWAII, INC.

Attachment F

Pressure test data

P. O. Box 700217 • Kapolei, HI 96709-0217 • Tel: (808) 682-1667 • Fax: (808) 682-1834 • E-Mail: E I Hawaii@aol.com

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Hydrostatic Test per ASME B31.3

Date: 1 Oct 08

Tank No. 20 Pipe Line: 16" Pipe Line

Portion of Line Tested: ____________________

Pipe Material: Carbon Steel

Test Pressure: 150 psig

Test Time: 4 Hours

Test Results: Acceptable ✓ Retest Required NO

Procedure: Fill line with water and pressurize line to 150 psig, inspect all visible joints for leakage. Hold pressure for four hours and record pressure and temperature readings every ten minutes on the attached log.

Notes:
Abandon in Place per NFESC

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By: [signature] 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Test Log Per ASME B31.3

Tank No. 20 Pipe Line: 16" Pipe Line

Date: 1 Oct 08

Start Time: 8:15 Ambient Temperature: 79

Time	Pressure (psig)	Pipe Temp. (deg F)	Notes
Start of Test	150	77°	
15 Minutes	150	77°	
30 Minutes	150	77°	
45 Minutes	150	77°	
60 Minutes	150	77°	
75 Minutes	150	77°	
90 Minutes	150	77°	
105 Minutes	150	77°	
120 Minutes	150	77°	
135 Minutes	150	77°	
150 Minutes	150	77°	
165 Minutes	148	77°	
180 Minutes	148	77°	
195 Minutes	148	77°	
210 Minutes	148	77°	
225 Minutes	148	77°	
240 Minutes	148	77°	

D&B Test Witnessed By: 10-1-08

Shaw/Govt. Test Witnessed By: 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Hydrostatic Test per ASME B31.3

Date: 1 Oct 08

Tank No. 20 Pipe Line: Slop Line

Portion of Line Tested: ______________________

Pipe Material: Carbon Steel

Test Pressure: 150 psig

Test Time: 4 Hours

Test Results: Acceptable NO Retest Required________

Procedure: Fill line with water and pressurize line to 150 psig, inspect all visible joints for leakage. Hold pressure for four hours and record pressure and temperature readings every ten minutes on the attached log.

Notes:
Failed!

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By: [signature] 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Test Log Per ASME B31.3

Tank No. 20 Pipe Line: Slop Line

Date: 1 Oct 08

Start Time: 8:15 Ambient Temperature: 79

Time	Pressure (psig)	Pipe Temp. (deg F)	Notes
Start of Test	~~[illegible]~~ 150	77°	
15 Minutes	150	77°	
30 Minutes	148	77°	
45 Minutes	148	77°	
60 Minutes	146	77°	
75 Minutes	146	97°	
90 Minutes	146	77	
105 Minutes	144	77	
120 Minutes	144	77°	
135 Minutes	144	77°	
150 Minutes	142	77°	
165 Minutes	138	77°	
180 Minutes	142	77°	
195 Minutes	140	77	
210 Minutes	140	77°	
225 Minutes	140	77°	
240 Minutes	140	77°	

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By:

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Hydrostatic Test per ASME B31.3

Date: 1 Oct 08

Tank No. 20 Pipe Line: 6" Steam Line

Portion of Line Tested: ______

Pipe Material: Carbon Steel

Test Pressure: 150 psig

Test Time: 4 Hours

Test Results: Acceptable NO Retest Required ✓

Procedure: Fill line with water and pressurize line to 150 psig, inspect all visible joints for leakage. Hold pressure for four hours and record pressure and temperature readings every ten minutes on the attached log.

Notes:
Retest when Converted to Slop line.

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By: [signature] 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Test Log Per ASME B31.3

Tank No. 20 Pipe Line: 6" Steam Line

Date: 1 Oct 08

Start Time: 8:15 Ambient Temperature: 79°

Time	Pressure (psig)	Pipe Temp. (deg F)	Notes
Start of Test	150	77°	
15 Minutes	150	77°	
30 Minutes	150	77°	
45 Minutes	150	77°	
60 Minutes	150	77°	
75 Minutes	150	77°	
90 Minutes	150	77°	
105 Minutes	150	77	
120 Minutes	150	77°	
135 Minutes	149	77°	
150 Minutes	148	77°	
165 Minutes	146	77°	
180 Minutes	144	77°	
195 Minutes	144	77°	
210 Minutes	143	77°	
225 Minutes	142	77°	
240 Minutes	142	77°	

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By: [signature] 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Hydrostatic Test per ASME B31.3

Date: 1 Oct 08

Tank No. 20 Pipe Line: 8" Steam Line

Portion of Line Tested: ____________________

Pipe Material: Carbon Steel

Test Pressure: 150 psig

Test Time: 4 Hours

Test Results: Acceptable ✓ Retest Required ✓

Procedure: Fill line with water and pressurize line to 150 psig, inspect all visible joints for leakage. Hold pressure for four hours and record pressure and temperature readings every ten minutes on the attached log.

Notes:
After welding of New Sample tubes Retest Steam line.

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By: [signature] 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Test Log Per ASME B31.3

Tank No. 20 Pipe Line: 8" Steam Line

Date: 1 Oct 08

Start Time: 8:15 Ambient Temperature: 79°

Time	Pressure (psig)	Pipe Temp. (deg F)	Notes
Start of Test	150	77°	
15 Minutes	150	77°	
30 Minutes	150	77°	
45 Minutes	150	77°	
60 Minutes	150	77°	
75 Minutes	150	77°	
90 Minutes	150	77°	
105 Minutes	150	77°	
120 Minutes	150	77°	
135 Minutes	150	77°	
150 Minutes	150	77°	
165 Minutes	150	77°	
180 Minutes	150	77°	
195 Minutes	150	77°	
210 Minutes	149	77°	
225 Minutes	149	77°	
240 Minutes	149	77°	

D&B Test Witnessed By: [signature] 10-1-08

Shaw/Govt. Test Witnessed By: [signature] 10-1-08

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Hydrostatic Test per ASME B31.3

Date: 10·9·08

Tank No. 20 Pipe Line: 32" / Slop Line

Portion of Line Tested: 32" Pipe @ 60'

Pipe Material: Carbon Steel

Test Pressure: 150 psig

Test Time: 4 Hours

Test Results: Acceptable X Retest Required____

Procedure: Step (1) ensure all lines have been emptied, (2) Cap/Blind each line (3) Fill line with water (4) Bleed line of all excess air (5) Pressurize line to 150 psig (6) Inspect line/blinds/cap & joints for leakage (7) If leaks are present repair as necessary (8) If no leaks hold pressure for four hours (9) Record pressure and temperature readings every ten minutes on appropriate log.

Notes:

D&B Representative:

Shaw CQC:

Dunkin & Bush, Inc.

Project No. N62472-03-C-1402
Pearl Harbor, Hawaii
Clean and Repair Red Hill Tanks 2 & 20

Cleaning Petroleum Tanks
Hydrostatic Test

Test Log Per ASME B31.3

Tank No. 20 Pipe Line: 32"

Date: 9 Oct 08

Start Time: 1245 Ambient Temperature: 79°

	Time	Pressure (psig)	Pipe Temp. (deg F)	Notes
1245	Start of Test	150	78°	
100	15 Minutes	150	78°	
115	30 Minutes	150	78°	
130	45 Minutes	150	"	
145	60 Minutes	150	"	
200	75 Minutes	150	78°	
215	90 Minutes	150	78°	
230	105 Minutes	150	78°	
245	120 Minutes	150	78°	
300	135 Minutes	150	78°	
315	150 Minutes	150	78°	
330	165 Minutes	150	78°	
345	180 Minutes	150	78°	
400	195 Minutes	150	78°	
415	210 Minutes	148	78°	
430	225 Minutes	148	78°	
445	240 Minutes	148	78°	

D&B Test Witnessed By: [signature]

Shaw/Govt. Test Witnessed By: [signature]

Dunkin & Bush, Inc.