

ATTACHMENT 16
OPEN BURNING/OPEN DETONATION OPERATIONS

TABLE OF CONTENTS

1.0	OB/OD DESIGN AND OPERATION	4
1.1	APPLICABILITY AS A MISCELLANEOUS UNIT	4
1.2	HAZARDOUS WASTE STORAGE AND VARIANCE.....	7
1.3	OPEN BURN (OB)	7
1.3.1	Appropriateness of Treatment Technology	7
1.3.2	Description of OB Unit.....	7
1.3.3	Leak Detection Provisions	9
1.3.4	Precipitation Cover	9
1.3.5	Control of Releases of Ashes and Residues During OB.....	9
1.3.6	Methods to Control Deterioration of Fabricated Devices.....	10
1.3.7	Prevention of Accumulated Precipitation Within Burn Pans.....	10
1.3.8	Handling of Precipitation Accumulated in Fabricated Devices.....	10
1.3.9	Controls to Prevent Wind Dispersion of Ash and Other Residue.....	10
1.3.10	Inspection, Monitoring, and Maintenance	11
1.3.11	Standing Operating Procedures.....	11
1.4	OPEN DETONATION (OD).....	11
1.4.1	Appropriateness of Treatment Technology.....	11
1.4.2	Description and Operation of OD Unit.....	11
1.4.3	Monitoring, and Maintenance Plan.....	15
1.4.4	Runon and Runoff Management.....	15
1.4.5	Standard Operating Procedures (SOPs).....	16
1.5	STATIC FIRING.....	16

LIST OF FIGURES AND TABLES

FIGURE 1. LOCATION OF OB/OD UNITS AT TEAD.....5

FIGURE 2. OPERATION AREA AT THE OB/OD AREA AT TEAD.....6

FIGURE 3. METEOROLOGICAL PARAMETERS FOR TEAD.....8

TABLE 1. TEAD EXPLOSIVE LIMITS FOR THE 3.5-IN. ROCKET FRAGMENT MUNITIONS 14

TABLE 2. DISTANCES FROM ABOVE-GROUND DETONATIONS TO UNPROTECTED PERSONNEL 15

TABLE 3. BLAST OVERPRESSURE PROTECTION DISTANCES TO NONESSENTIAL PERSONNEL..... 16

APPENDIX A DETAILED BURN PAN DRAWINGS

APPENDIX B DETAILED STATIC FIRE SILO DRAWINGS

APPENDIX C DETAILED OPEN DETONATION AREA DRAWINGS

1.0 OB/OD DESIGN AND OPERATION

1.1. Applicability as a Miscellaneous Unit

1.1.1 The Permittee conducts thermal treatment of conventional energetic material items at the Open Burn/Open Detonation (OB/OD) Area. The principal work activities at Tooele Army Depot (TEAD) are the shipping, receiving, maintenance and demilitarization of conventional munitions, and the testing and development of ammunition peculiar equipment and related demilitarization testing. The location of the OB/OD Area is shown in Figure 1 and a detailed map showing the OB/OD operations area is shown in Figure 2. Treatment by OB/OD falls under the miscellaneous units provisions in the Utah Admin. Code R315-264-600.

1.1.2 OB/OD is used for treatment of some energetic materials because this is the only safe and effective treatment process currently available for those energetic material items. The selection of OB/OD is based on energetic material item-specific information developed by the U.S. Army based on energetic material type and content, explosion potential, and historical experience. The U.S. Army is continuing to study and evaluate alternative treatment processes that may be used in the future, rather than OB/OD, to treat appropriate energetic materials. The Permittee reports progress in developing alternative technologies as part of the annual waste minimization certification.

1.1.3 Because the OB and OD treatment processes are a non-continuous (i.e., batch) process, the facility is not subject to steady-state or "normal" operating conditions. Wastes shall be treated by the Demil Team according to Standard Operating Procedures (SOPs). The SOPs detail the handling of the explosives from storage to unloading, the tools to be used, setting the charge, and, ultimately, burning or detonation.

1.1.4 There are major advantages for using OB and OD disposal practices. These include the following:

1.1.4.1 Safety is the most important consideration. Strict observance of proven OB and OD procedures has resulted in an excellent safety record being earned by the personnel who have helped to treat the many millions of pounds of waste military energetic materials safely over the last four decades at numerous Department of Defense (DOD) installations.

1.1.4.2 These types of operations are extremely versatile; large or small quantities of the myriad types of materials can be treated easily and safely.

1.1.4.3 Because of their inherent simplicity, OB and OD are extremely reliable processes not subject to equipment downtime.

1.1.4.4 Both OB and OD are very efficient treatments as demonstrated by testing. This is discussed in further detail in Attachment 17 (OB/OD Treatment Effectiveness, Alternative Technologies and Waste Minimization).

Figure 1

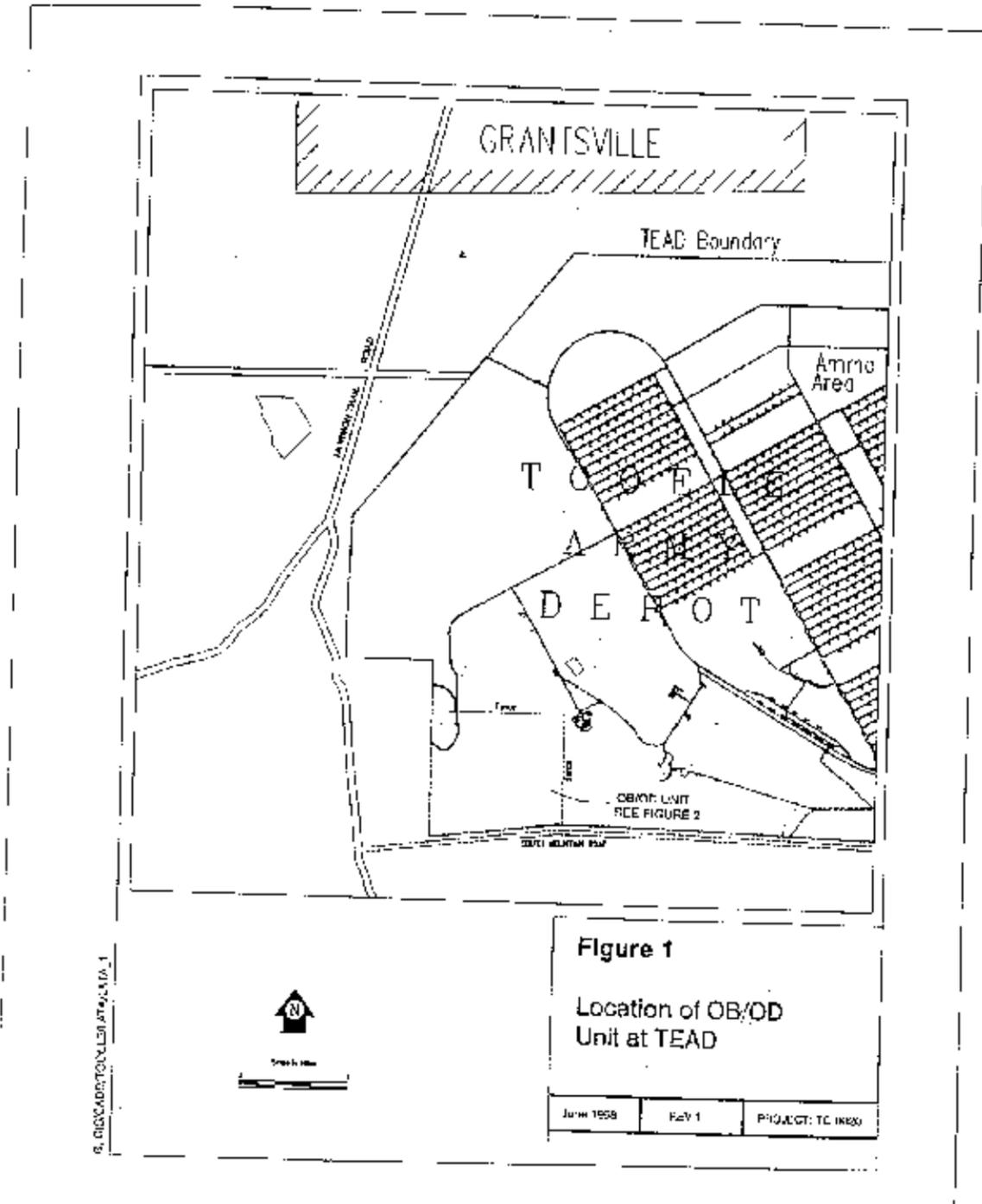
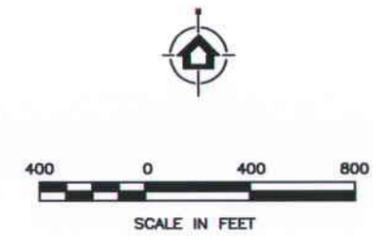
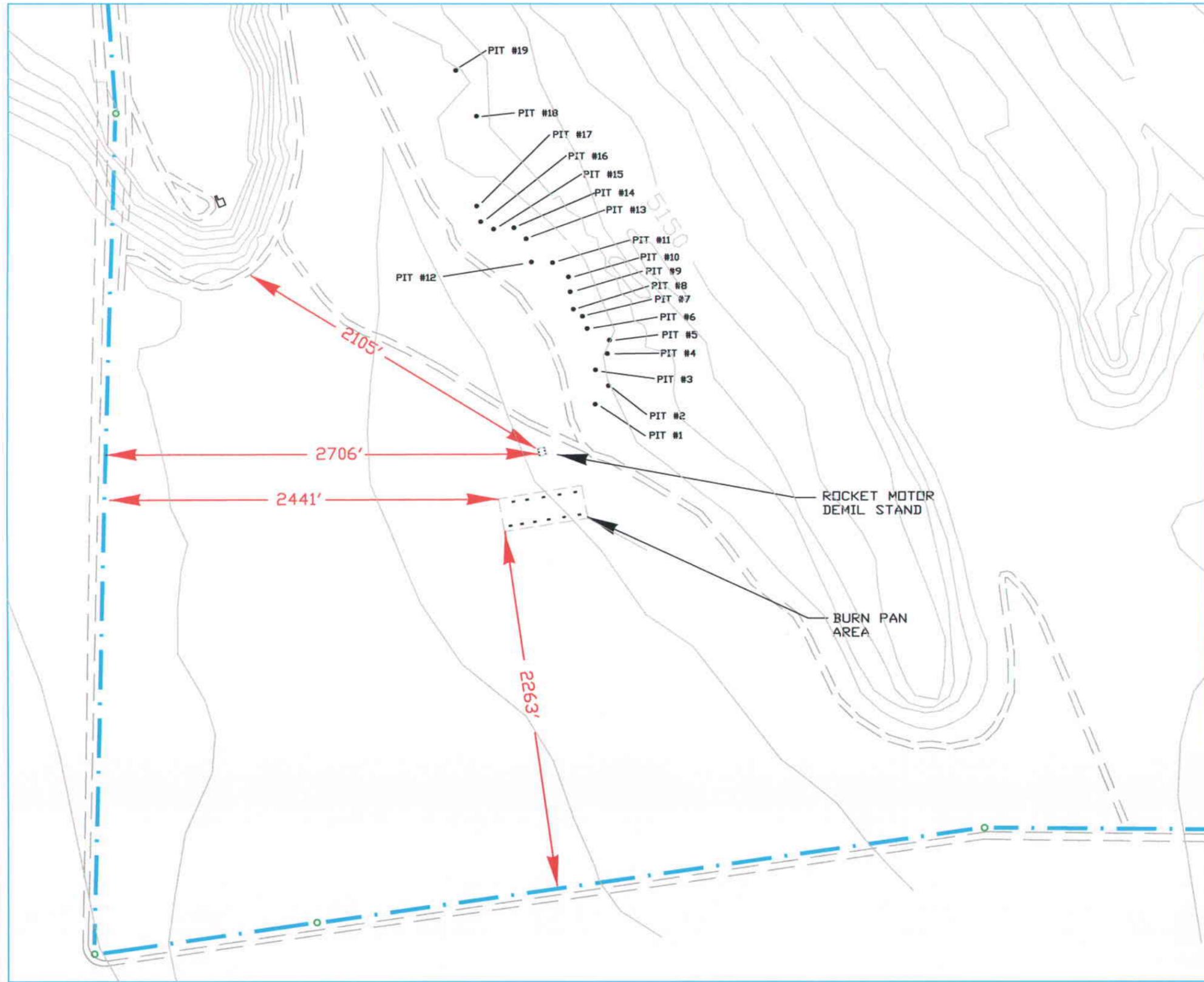


Figure 1



PUBLIC WORKS TOOELE ARMY DEPOT TOOELE, UTAH		
TOOELE ARMY DEPOT TOOELE, UTAH		
Operation Area of OB/OD		
DRAWN BY: BOB THURSTON	FEBRUARY 2008	Figure 2

1.2. Hazardous Waste Storage and Variance

1.2.1 The Permittee shall not treat nonreactive waste at the OB/OD Units other than incidental packaging.

1.2.2 Currently the Permittee only accepts waste from Tooele Army Depot South Area (TEAD-S) for treatment at the OB/OD Units. Munitions are treated the same day that they are received at the OB/OD Units. In the case of weather delays, munitions are treated as soon as possible (generally within 24 hours). Should treatment be delayed, the munitions will be stored in place, in accordance with the OB/OD/SF Standard Operating Procedures, until conditions permit treatment to commence. Weekly inspections for the munitions stored in the OB/OD units will be conducted as outlined in Attachment 4 (Inspection Plan).

1.3. OPEN BURN (OB)

1.3.1 Appropriateness of Treatment Technology

The reason that OB is an appropriate treatment technology for unserviceable munitions is discussed in Section 1.1.

1.3.2 Description of OB Unit

1.3.2.1 OB occurs at the OB unit. The OB unit is about 200 feet directly south of the OD unit. Figures in Appendix A show the burn pans at the OB Unit. Treatment at the OB unit is accomplished by the use of 14 burn pans. Items typically treated are bulk propellants. No donor charges shall be used in OB.

1.3.2.2 The 14 burn pans are designed and constructed similarly. The dimensions of each of the 14 pans are approximately 16 ft x 4 ft x 11 inches deep. A schematic of a typical burn pan is provided in Appendix A. Appendix A also has the detailed drawings of the burn pans used at the Facility. The burn pans are approximately 60 feet apart. Each pan is elevated approximately 1 foot above the ground. The position of the legs of the structure allows for easy inspection of the bottom of each pan and the surface of the ground beneath them. The pans are constructed of steel, and covers are placed over them when they are not in use, or when propellant is being stored in place.

1.3.2.3 Prior to conducting OB, certain meteorological conditions must be met. Figure 3 lists the meteorological parameters for the Facility. The Demil Team Leader, or his/her designated representative, shall ensure that all firing has ceased when aircraft approach the area. Designated observers have effective communications with the Range Supervisor any time an aircraft approaches the area. OB shall not be initiated until 10:00 a.m. and not after 5:00 p.m.. Meteorological data are obtained from the:

- Salt Lake City National Weather Services (<http://nimbo.wrh.noaa.gov/slc>); or
- AccuWeather (<http://accuweather.com>).

Figure 3. Meteorological Parameters for TEAD

Parameters	TEAD Requirement
Wind speed	3-20 mph/gusts to 30 mph
Cloud cover (see note)	<80%
Ceiling	>2,000 ft.
Precipitation	<75% chance
Thunderstorm/electrical storm	<50% chance
Clearing index	>500
Visibility	1 mile
<p>Source: AMC Regulation 755-8. Note: Cloud cover and ceiling limits are in conjunction with each other. Operations shall not be carried out when the cloud cover is greater than 80% and the cloud ceiling is less than 2,000 ft.</p>	

1.3.2.4 An on-site meteorological tower provides site-specific data. A determination is made prior to burning whether to cease operations or to continue based on the meteorological data. This information shall be recorded on a form. The demil operations shall be determined “GO” or “NO GO” by weather forecasts as described above. When forecasts indicate a “GO” condition, demil operations proceed. However, if the weather conditions deteriorate as observed by the Demil Team Leader or his/her designated representative for the operation, he/she contacts the Demil Planner. A determination is made whether to continue the operation with the propellant already in the pan or to store the propellant in the pan and then burn it as soon as permit conditions allow. Propellant shall not be placed in the pan after weather conditions have deteriorated.

1.3.2.5 The Demil Planner annotates on the Demilitarization Approval Form that each organization has been notified. The Demil Planner takes this Demilitarization Approval Form to the Directorate of Ammunition Operations or his/her designated representative for approval/disapproval. The Demil Planner phones the Demil Team Leader to inform whether the mission has been approved /disapproved. The Demil Team Leader phones the Demil Planner to describe when charges have been set and when they are ready to burn.

1.3.2.6 The preliminary steps prior to the actual OB activities are similar to those for the OD practice. Dry grass, leaves, and other extraneous combustible material in amounts sufficient to spread fires shall be removed within a radius of 61 m (200 feet) from the pans. Meteorological data are checked, and trays are arranged so that the propellants burn in the opposite direction from which the wind is blowing. Telephone or two-way radio communications shall be established and shall remain in operation during the entire OB operation.

1.3.2.7 The propellant to be burned is loaded into the pans. The propellant is poured into the pans with extreme care taken to prevent the occurrence of spills. The propellant is placed in the pan to a thickness no greater than 7.5 cm (3 in.). The area is then cleared of all personnel

except for those needed to install the igniting charge into the pans. When the area is determined to be clear, the igniting charges are laid in the pans and activated.

1.3.2.8 The burn operation is observed from a safe position, and fire-fighting equipment is made available to combat grass, brush, or equipment fires. Qualified personnel check pans and ensure that all propellant has been burned. At the end of each day's operation, all extraneous operations materials shall be removed from the OB unit. Ash and residue are gathered, containerized in an authorized container, labeled as hazardous waste, and stored at the satellite accumulation area (SAA) at the OB/OD Area.

1.3.2.9 The Demil Team shall operate the OB unit in accordance with Standard Operating Procedure (SOP) No. TE-0000-H-012. This SOP provides additional information on current procedures.

1.3.3. Leak Detection Provisions

1.3.3.1 This section addresses the concern that ash/residue or wastes may be released from the burn pan if it develops a leak, a break, or a crack. The potential for such a release shall be minimized through pre-burn and post-burn inspections of burn pan integrity. The burn pan is situated above ground on two I-beams to allow visual inspection for leaks. The use of I-beams facilitates the conduct of routine integrity inspections of the burn pans.

1.3.3.2 Any pan showing any evidence of deterioration shall not be used. Damaged pans shall be repaired prior to being returned to use. Additionally, the structural integrity of steel pans has been shown to be reliable in previous U.S. Army tests at the Tooele Army Depot.

1.3.3.3 Any ejecta shall be collected during the post-burn inspection and shall be reburned the same day.

1.3.4. Precipitation Cover

1.3.4.1 Each burn pan is equipped with a precipitation cover. The covers are tight fitting and shall remain on the burn pans during non-operational or storage periods to prevent accumulation of precipitation and wind dispersion of any ash and residue.

1.3.5 Control of Releases of Ash and Residue During OB

1.3.5.1 This section addresses the concern that the propellant, waste, or ashes will be ejected from the burn pan onto the ground during burning operations, potentially resulting in environmental contamination via the soil, surface water, and groundwater pathways. The potential for contamination is minimized during OB by several measures. First, the burn pan is of sufficient height to minimize the ejection of most waste. Second, post-burn inspection of the area surrounding the pan would reveal the presence of ejected materials, which are subsequently collected. A determination shall be made as to whether there is any remaining contamination by having experienced personnel carefully inspect the pans and the surrounding area after a burn.

1.3.5.2 It is considered unsafe to approach the burn pan for ash removal and inspection until a sufficient time has passed to allow all materials in the pan to cool. The pan shall be inspected after a burn to make sure that all the propellants have burned and the pan shall then be covered. Any visible ejecta from the pan shall be collected and placed back in the pan. Although every effort is made to pick up visible ejecta, it is possible that some very small particles may escape detection. After OB, pans are inspected, and any ash shall be collected and temporarily stored in appropriate containers at the SAA at the OB/OD Area. When the container is full, a composite sample shall be collected and analyzed. Full containers shall be removed within 3 days and taken to a 90-day or permitted storage unit.

1.3.6. Methods to Control Deterioration of Fabricated Devices

1.3.6.1 The most serious deterioration or malfunction during OB would be loss of burn pan integrity such as a burn pan leak. However, routine pan integrity inspections are conducted prior to and after each OB treatment event. In the event of an accidental release of waste propellants before or during a burn event, the released waste materials shall be collected and re-treated in a different burn pan. Specific response procedures are established and are contained in Attachment 7 (Contingency Plan). Procedures to prevent hazards are discussed in Attachment 6 (Preparedness and Prevention Plan).

1.3.7. Prevention of Accumulated Precipitation in Burn Pans

1.3.7.1 Precipitation accumulation in the burn pan during non-operational periods is prevented through the use of a precipitation cover. Covers are tight fitting, shall be secured in place over the pans, and shall remain on the pans during non-operational periods. Precipitation accumulation in the pan during OB events and cool downs is minimized by conducting OB events only at times when precipitation is not expected. OB treatment operations are not conducted during low overcast sky (i.e., cloud cover of 80% or more and cloud ceiling of less than 2,000 feet) and during precipitation or forecasted high probability of precipitation (greater than 75%). Following a waiting period (based on safety considerations) after the burn, the pan shall be inspected and its cover replaced.

1.3.7.2 If water has accumulated in the pans, it shall be drained out into an appropriate container prior to a burn. The drained water shall be sampled by Environmental Management Division personnel and placed into hazardous waste storage until the analysis can be reviewed to determine the correct disposition of the water.

1.3.8. Handling of Precipitation Accumulated in Fabricated Devices

1.3.8.1 If precipitation accumulates in the ash while the ash is in the burn pan prior to being removed the precipitation shall be removed with the ash and shall be considered part of the waste.

1.3.9. Controls to Prevent Wind Dispersion of Ash and Other Residue

1.3.9.1 Certain administrative controls shall be used to protect human health and the environment. These include controls to prevent wind dispersion of ash and other residue, such as operating only during moderate wind speeds (i.e., greater than 3 mph to less than 20 mph) to reduce the potential of fugitive particulate emissions. The propellants are generally in the form of pellets, and other energetic materials are contained in casings. Thus, wind dispersion of these energetic wastes is not a problem. The high walls of the burn pan minimize the potential for fugitive wind erosion of these materials.

1.3.9.2 The cover of the burn pan shall be replaced after completion of the burn (after a wait time for safety reasons). In addition, the high sides of the burn pan reduce the potential for wind erosion during pre- and post-burn conditions when the cover is off.

1.3.10. Inspection, Monitoring, and Maintenance

1.3.10.1 The OB unit shall be inspected before and after use in accordance with Attachment 4 (Inspection Plan).

1.3.11. Standing Operating Procedures

1.3.11.1 All OB activities at the Facility are conducted by the Demil Team in accordance with SOP No. TE-0000-H-012. The SOP prescribes the responsibilities, policies, and procedures for the operation of the OB unit. This SOP shall be amended, as necessary, to reference and be consistent with all conditions of RCRA. The SOP retains the environmental performance standards specified in this permit.

1.3.11.2 The Demil office shall maintain the official file for all treatment activities in the OB unit. As stated in Attachment 2 (Waste Analysis Plan) ash residue analysis results shall be maintained by the Environmental Management Division.

1.4 OPEN DETONATION (OD)

1.4.1. Appropriateness of Treatment Technology

1.4.1.1 The reason that OD is an appropriate treatment technology for unserviceable munitions is discussed in Section 1.1.

1.4.2. Description and Operation of OD Unit

1.4.2.1 The OD pits are in the southwestern corner of the Facility. The entire OB/OD Area is approximately 780 acres. OD is conducted in 19 pits. These pits are numbered 1 through 19. The figures in Appendix C show the location of the pits in relation to the static fire silos and burn pans. The area is a broad dissected alluvial fan emanating from the Stansbury Mountains. OD is conducted in subsurface pits that are covered with native soil. The depth of the pits is determined by the quantity of munitions treated. There are no engineered features at this OD unit to detect or prevent releases. Due to the nature of OD, engineered features could be destroyed by detonation.

1.4.2.2 Prior to conducting OD, certain meteorological conditions must be met. Acceptable meteorological conditions for conducting OD are indicated in Figure 3 and in the SOP. OD shall not be initiated until at least 10:00 a.m. and shall conclude at or before 5:00 p.m.. Meteorological data are obtained from the:

- Salt Lake City National Weather Services (<http://nimbo.wrh.noaa.gov/slc>); or
- AccuWeather (<http://accuweather.com>).

1.4.2.3 The Demil Team Leader or his/her designated representative shall ensure that all firing has ceased when aircraft approach the area. Designated observers have effective communications with the Range Supervisor any time an aircraft approaches the area

1.4.2.4 An on-site meteorological tower provides site-specific data. A determination is made prior to detonation whether to cease operations or to continue based on meteorological data. This information shall be recorded on a form. The demil operations shall be determined “GO” or “NO GO” by weather forecasts as described above. When forecasts indicate a “GO” condition, demil operations proceed. However, if the weather conditions deteriorate as observed by the Demil Team Leader or his/her designated representative he/she contacts the Demil Planner. A determination is made whether to continue the operation with the ammunition already in the pit or to store the ammunition in the pit and detonate it as soon as permit conditions allow. Ammunition shall not be placed in the pit after weather conditions have deteriorated.

1.4.2.5 The Demil Planner annotates on the Demilitarization Approval Form that each organization has been notified. The Demil Planner takes the Demilitarization Approval Form to the Directorate of Ammunition Operations or his/her designated representative for approval/disapproval. The Demil Planner phones the Demil Team Leader to inform whether the mission has been approved/disapproved. The Demil Team Leader phones the Demil Planner to tell when charges have been set and when the team is ready to detonate.

1.4.2.6 The design elements that are used to provide protection of human health and the environment include: using the appropriate burial depth depending on treatment quantity; burying the munitions to appropriate depths; locating the OD unit far from public roads and inhabited housing; limiting the treatment amounts to 750 lbs. NEW per pit, per event (including donor) ; only treating appropriate reactive materials; re-treating any unexploded ordnance (UXO); operating only during appropriate weather conditions; and restricting access to the unit by the use of warning signs, gates, and a surveillance team. A treatment event is defined as a day of open detonation operations with limits of 750 pounds per pit and ten pits per day assuming 7,500 pounds per hour worst case scenario as modeled in the HHRA.

1.4.2.7 The Permittee is limited to the pit explosive limits specified in Condition VI.B.4. and Table 1 for the 3.5-in. rocket fragment munitions. Any additional munitions shall be considered on a case-by-case basis for explosive limits. If it is determined that the munitions are of greater explosive quantity or different type, additional tests shall be conducted to determine debris/fragment throw range. A 20% factor is added to the maximum throw range as a safety factor.

1.4.2.8 Earth cover for the detonations is also specified in SOP No. TE-0000-G-010. Requirements are as follows:

- 0-50 lbs. NEW (including donor) requires no earth cover
- 51-750 lbs. NEW (including donor) requires 15 feet of earth cover.

1.4.2.9 TEAD OD SOP No. TE-0000-G-010 also specifies the distances that are required from above-ground (unburied) detonations to unprotected personnel. This is specified in Table 2. If the OD materials are buried, Table 3 is used. In lieu of the formula specified in Table 3, column A of Table 3 may be used for above-ground detonations. If the materials to be detonated are buried, the reduced distance provided by columns B through I of Table 3 can be used.

1.4.2.10 Prior to conducting OD operations, as in OB operations, dry grass, leaves, and other combustible materials are cleared within a 61 m (200 ft) radius from the pits.

Table 1. TEAD explosive limits for the 3.5-in. rocket fragment munitions

Pit no.	Distance boundary	Non frag	Less than 5''	Untested 5'' or greater	Tested 5'' or greater
1	2912 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
2	2992 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
3	3091 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
4	3194 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
5	3168 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
6	3141 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
7	3115 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
8	3058 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
9	3000 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
10	2945 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
11	2879 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
12	2814 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
13	2745 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
14	2676 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
15	2608 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
16	2521 Feet	750 lbs.	750 lbs.	0 lbs.	750 lbs.
17	2348 Feet	750 lbs.	0 lbs.	0 lbs.	0 lbs.
18	2213 Feet	750 lbs.	0 lbs.	0 lbs.	0 lbs.
19	2362 Feet	750 lbs.	0 lbs.	0 lbs.	0 lbs.

1.4.2.11 The placement of the initiating charges and the amount of initiating charge are determined by the amount and nature of material being treated and are specified in Army manuals. Munitions are detonated by either non-electrical or electrical methods. The only residues generated as a result of OD operations are metallic materials such as shell fragments (shrapnel) and occasionally pieces of energetic materials or UXO that were not completely

treated during OD. The OD unit is inspected for these materials following OD. After each day of detonation operations, a search of the surrounding area shall be made for unexploded munitions. Unexploded residue or items or material such as lumps of explosives or unfuzed ammunition shall be picked up and stored in a pit for the next detonation. Recovery and detonation of fuzed ammunition or suspected live munition items shall be treated in accordance with SOP No. TE-0000-G-010. All items or material (fuzed, unfuzed, and live munitions) found must be detonated within two working days of the time they are recovered or stored in the pit(s) until conditions of the permit are met to allow detonations.

1.4.2.12 Analysis of the OD treatment residue is not conducted at the Facility. The Permittee periodically recovers scrap metal, casing, fragment, and related items from the OD grounds as resources allow, and based on the Demil Team Leader’s judgment regarding safe operation of the range. The recovered material is disposed of through the Defense Logistics Agency (DLA) Disposition Services. The Demil team shall inspect and document the recovered material to ensure it is explosive free. The Ammunition Surveillance Inspector shall verify the documentation. Management of ash and residues is discussed further in Attachment 2 (Waste Analysis Plan).

1.4.2.13 The munitions are on pallets that are transported to the OD pit via forklift or roller conveyor. The palletized munitions are positioned in such a manner to ensure complete detonation. The palletized munitions requiring unpacking are removed to the unpack operation near or within the demolition pit using a forklift. A minimum of 10 feet of separation is maintained between unpack operations and materials stacked in the OD pit. Information about the specific item being treated is used to determine appropriate treatment. For example, bombs and mortar projectiles are as much as 80% (by weight) explosives and have relatively thin walls, as compared with artillery shells, which are 10 to 15% explosives and have relatively heavy walls. The Demil Team personnel maintain an extensive collection of Army Technical Manuals to provide guidance on appropriate OD procedures for specific items (e.g., Technical Manual - Ammunition and Explosives Standards, TM 9-1300-206, Headquarters, Department of the Army, August 1973).

Table 2. Distances from above-ground detonations to unprotected personnel

Material to detonate	Blast distance	Fragment/debris
Non-frag explosive material	$D = 328W^{1/3}$	1,250 feet
Bombs and projectile with a diameter less than 5 inches	$D = 328W^{1/3}$	2,500 feet
Bombs and projectiles with a diameter of 5 inches or more	$D = 328W^{1/3}$	4,000 feet
All other ammunition	$D = 328W^{1/3}$	2,500 feet

Note: W is the net explosive weight in pounds.

Table 3. Required blast overpressure protection distances to nonessential personnel*

NEW in lbs.	Distance in feet for various burial depth								
	0 FT COL A	1 FT COL B	2 FT COL C	3 FT COL D	4 FT COL E	5 FT COL F	7 FT COL G	10 FT COL H	15 FT COL I
1	328	79	16	16	16	16	16	16	16
5	561	261	104	41	28	28	28	28	28
10	707	398	191	92	44	35	35	35	35
20	890	464	326	182	102	57	45	45	45
30	1019	566	368	260	157	94	51	51	51
40	1122	650	439	329	208	131	62	56	56
50	1208	721	501	349	255	166	71	60	60
100	1522	984	737	553	414	326	165	76	76
150	1743	1171	911	708	550	428	256	105	87

*Required Blast Overpressure protection distances to nonessential personnel from ranges used for detonating ammunition for the purposes of demilitarization, demonstration, or explosives ordnance disposal.

1.4.3. Monitoring, and Maintenance Plan

1.4.3.1 The OD area shall be inspected before and after use in accordance with Attachment 4 (Inspection Plan).

1.4.3.2 After each day of detonation operations, a search of the surrounding area shall be made for unexploded munitions. Items or material such as lumps of explosives or unfuzed ammunition shall be picked up and prepared for the next detonation. Recovery and detonation of fuzed ammunition or suspected live munition items are treated in accordance with SOP No. TE-0000-G-010. All items or material (fuzed, unfuzed, and live munitions) found shall be detonated within two working days of the day they are found, or be stored within the pits(s) until permit conditions allow them to be detonated.

1.4.4. Run on and Runoff Management

1.4.4.1 Precipitation should not contact the waste during OD because OD is not conducted during or prior to rain. Should conditions create delays, once the pits have been loaded, munitions will be stored and remain in place until detonations are permitted. After OD the only remaining material, shrapnel, shall be visually inspected to make certain it does not contain any UXO. If UXO is found, the material shall be retreated.

1.4.5. Standard Operating Procedures (SOPs)

1.4.5.1 OD operations are conducted in accordance with TEAD SOP (SOP No. TE-0000-G-010). This SOP is periodically reviewed and updated. The SOP will be revised, as necessary, to be commensurate with conditions of this permit.

1.5. Static Firing

1.5.1 Static firing of rockets and missiles is similar to open burning as only the propellant is burned and the metal from the rocket or missile is recycled. The static firing unit is located mid-way between the demolition pits and the open burn pans. Appendix B shows the static firing silos at the OB/OD Area. Treatment is accomplished by the use of six silos. Items typically treated are solid propellant rockets and missiles. No donor charges are used in static firing.

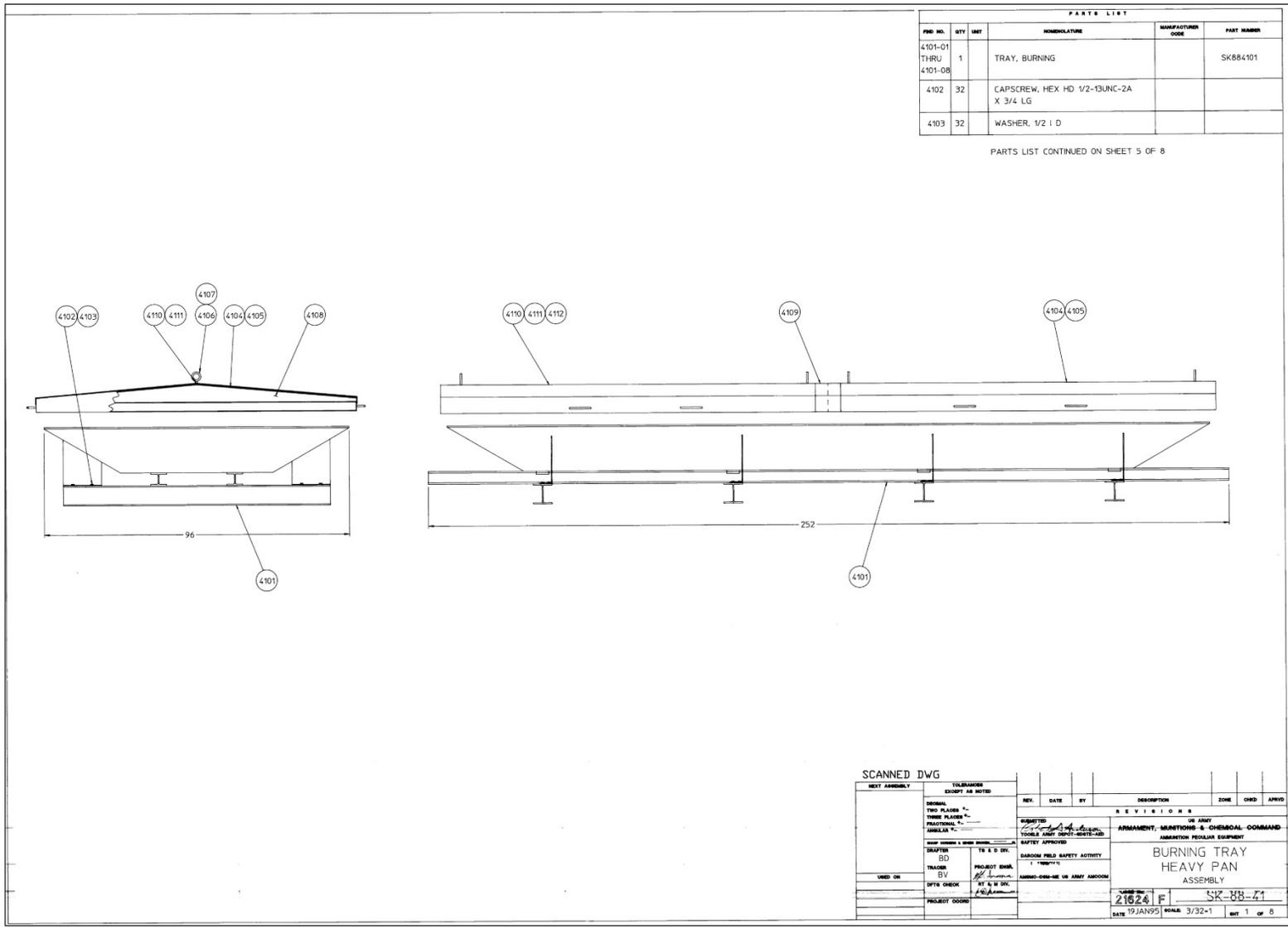
1.5.2 The silos are located, in two rows 40 feet apart and 20 feet between each silo, on a rebar-reinforced concrete pad 52 feet by 10 feet deep. Covers shall be placed over the silos when they are not in use or when items are being stored in place. Prior to conducting static firing, the same meteorological conditions as for open burning and open detonation must be met see Figure 3.

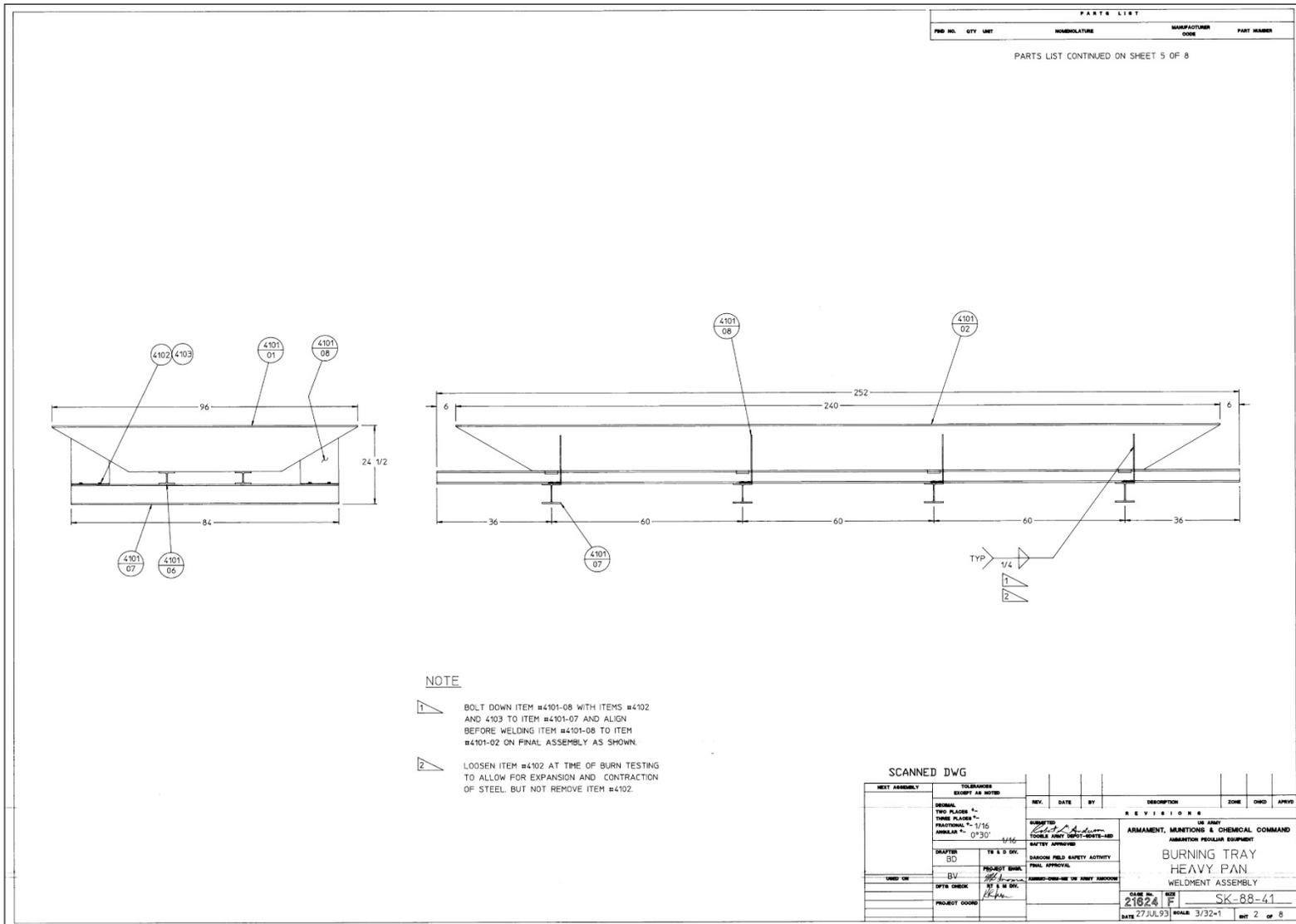
1.5.3 Operating procedures prior to the actual static firing activity are similar to those used in open burning. Dry grass, leaves and other extraneous combustible material in amounts sufficient to spread fires shall be removed within a radius of 61 meters (200 feet) from the silos. Meteorological conditions shall be checked and the silos inspected before each event. Carousels designed for each rocket are prepared and lowered into the silos. Rocket motors are lowered into the carousels and secured in place. The area is then cleared of all personnel except for those needed to install the firing wire to the rocket or missile igniter. When the area is determined to be clear, the rocket motors are electrically ignited from a safe position.

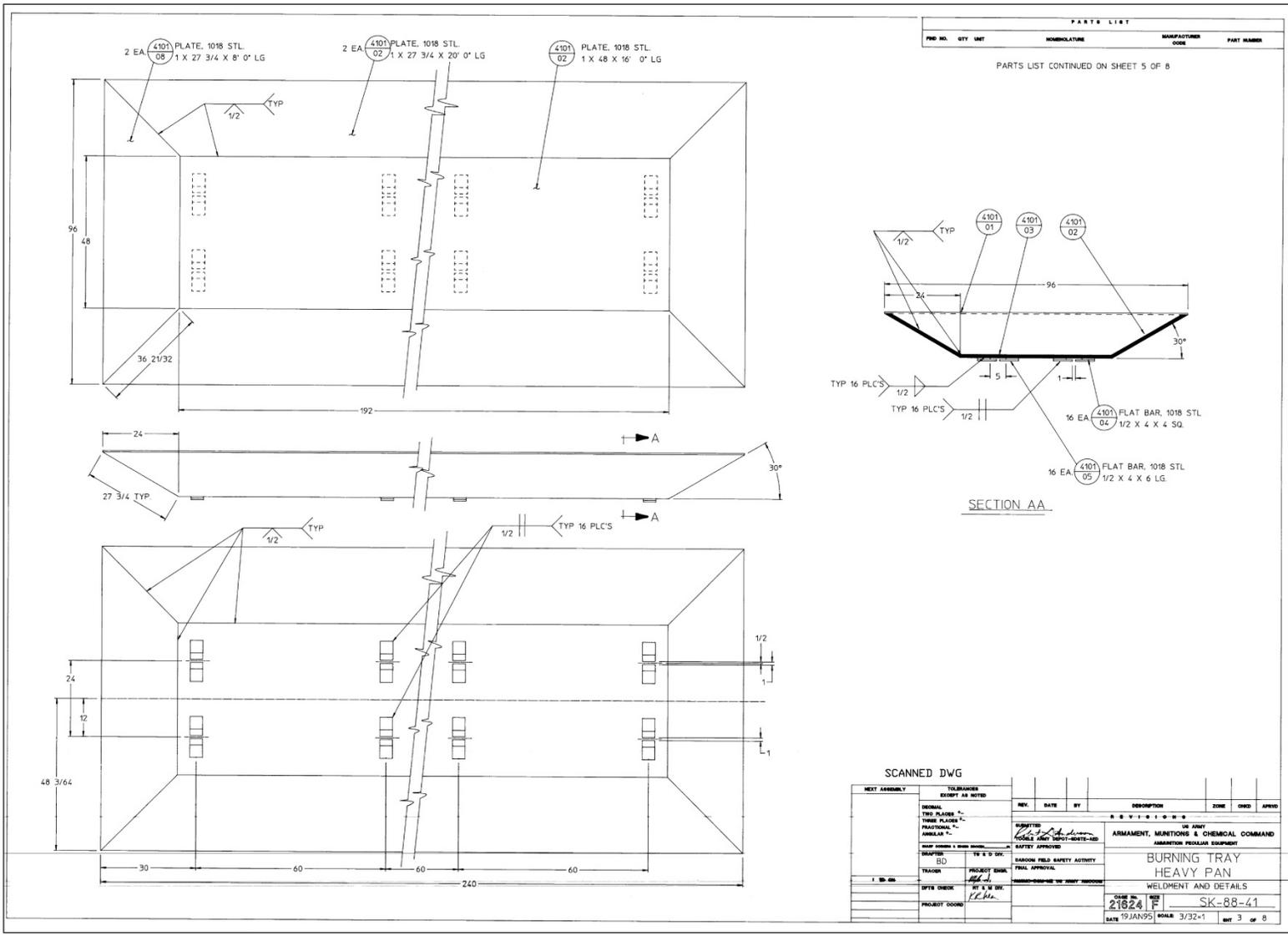
1.5.4 Firefighting equipment shall be available to combat grass, brush or equipment fires. Qualified personnel check the silos to ensure that all of the propellant has been burned.

1.5.5 Demil personnel shall operate the Static Fire Area in accordance with SOP No. TE-0000-J-168. This SOP provides additional information on current operating procedures.

APPENDIX A
DETAILED BURN PAN DRAWINGS



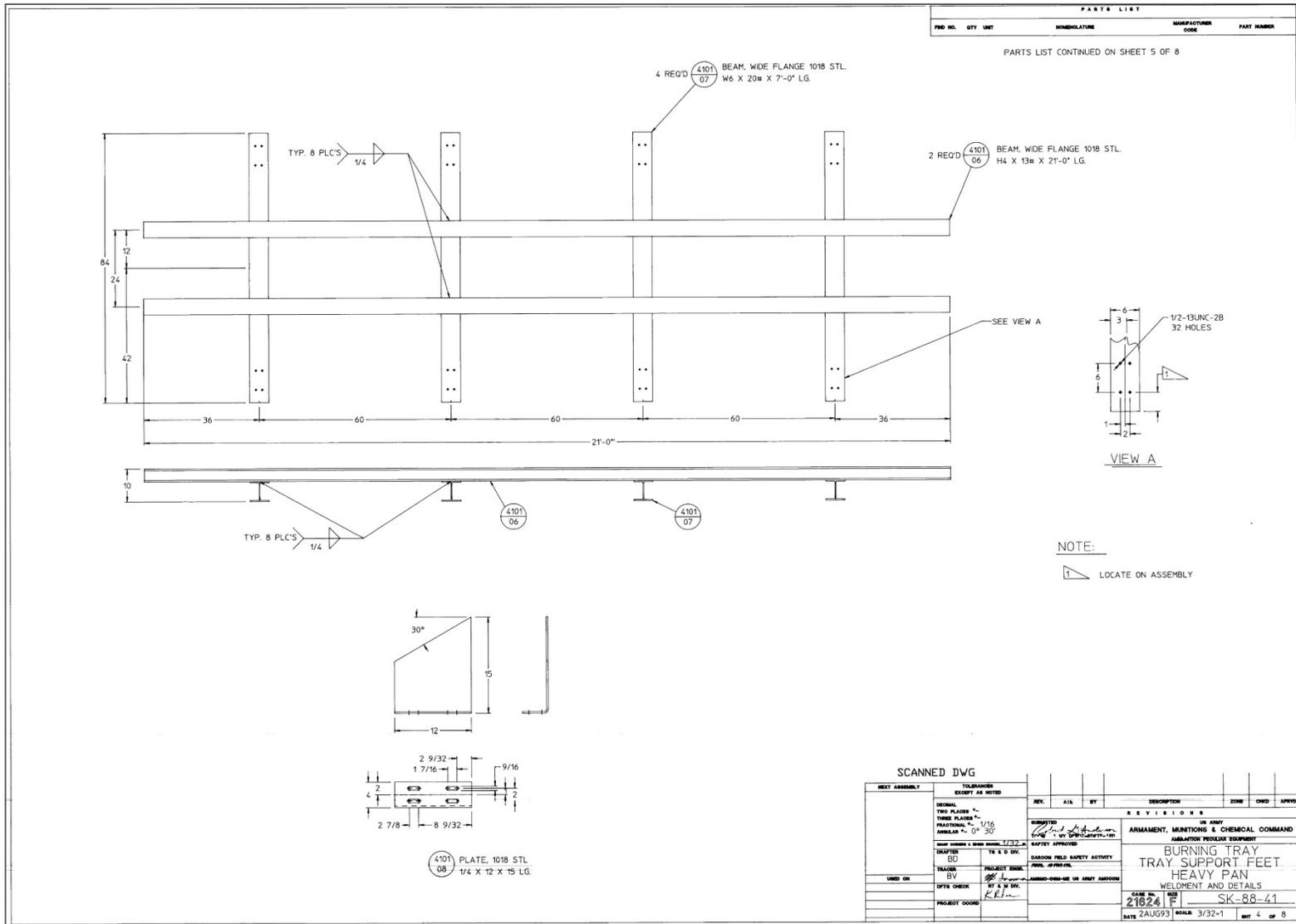


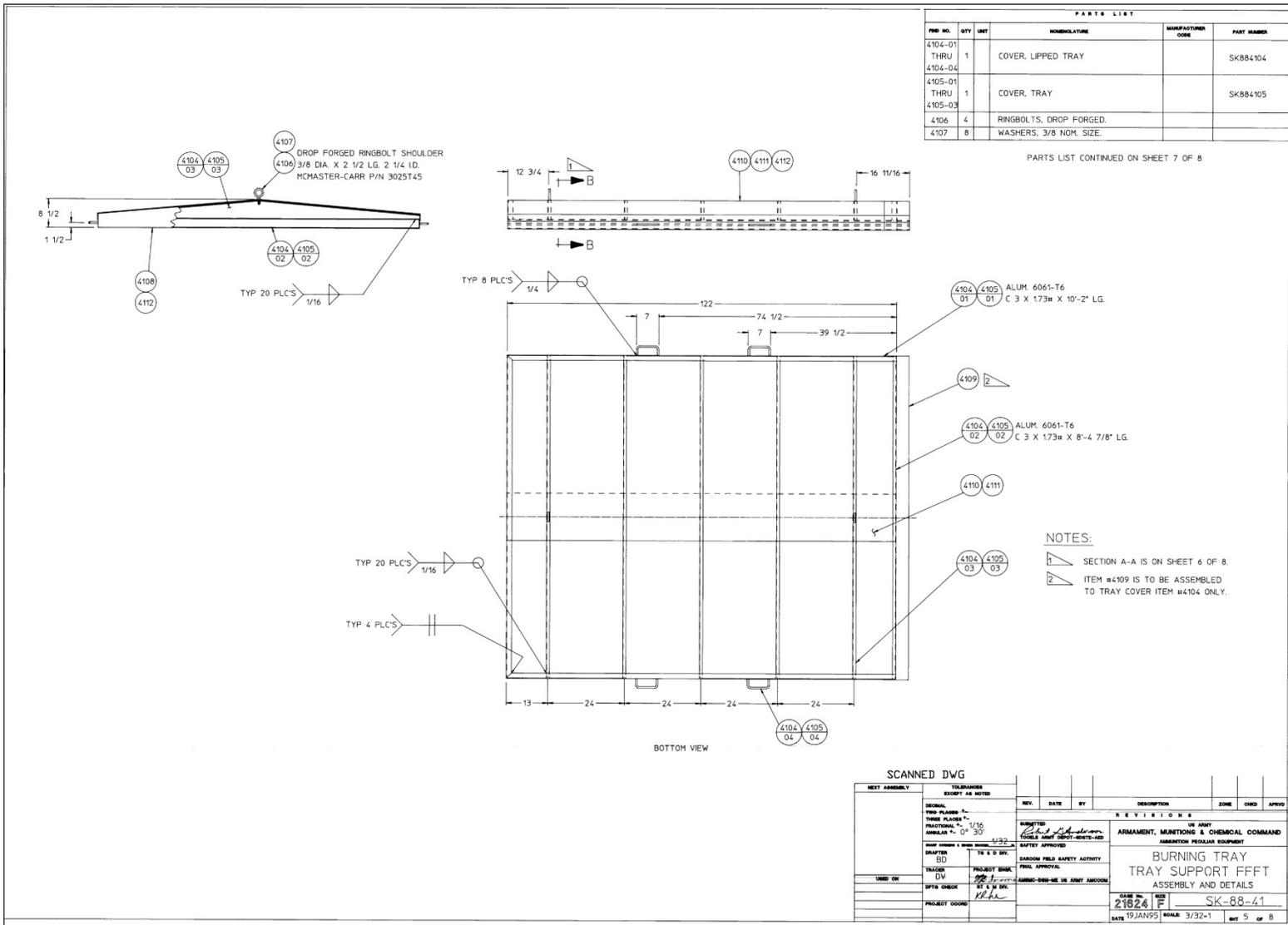


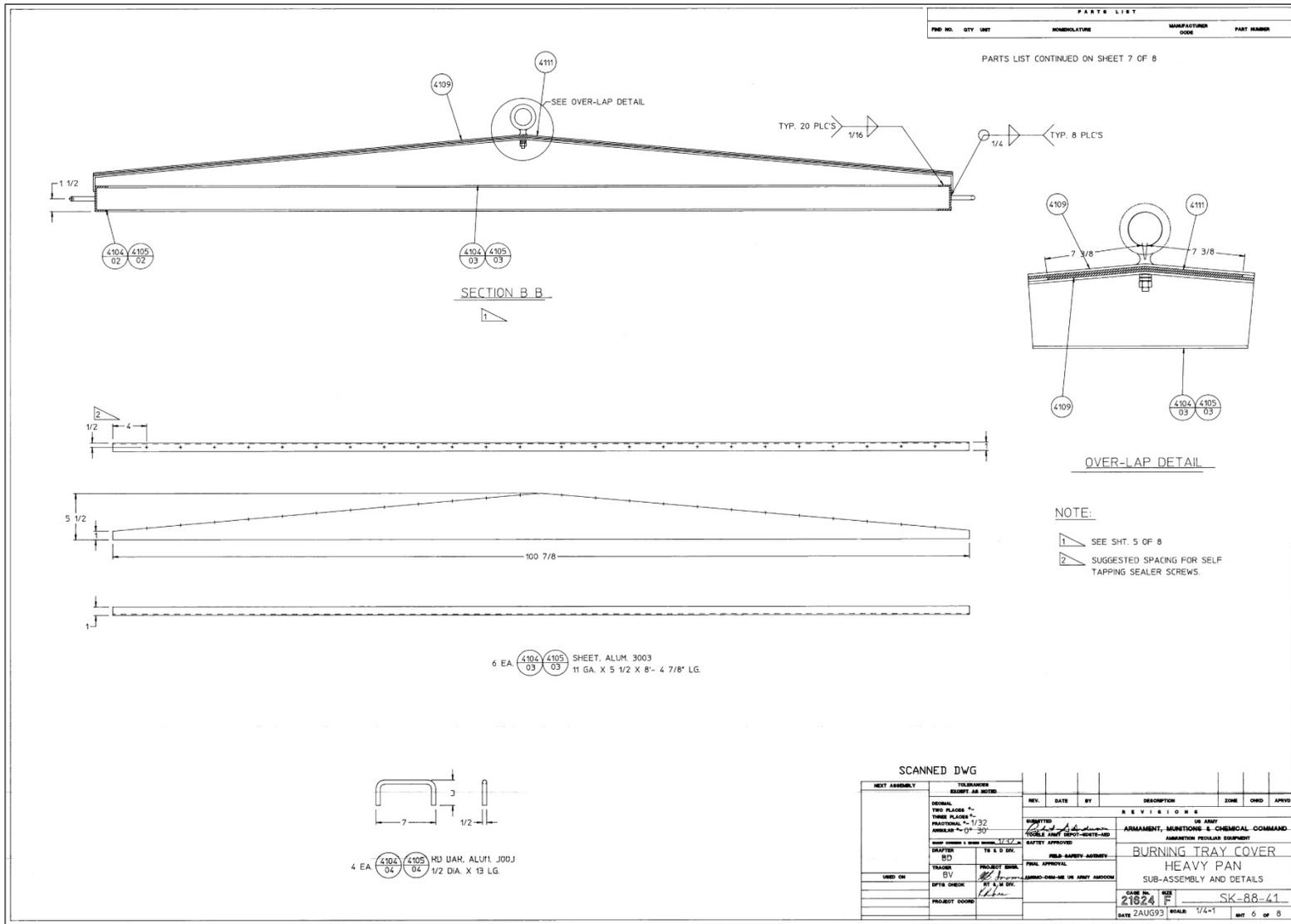
Attachment 16 – OB/OD Units
Tooele Army Depot

Appendix A

February 2, 2017
UT3213820894



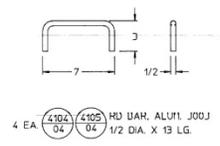




PARTS LIST			
PART NO.	QTY	UNIT	PART NUMBER

PARTS LIST CONTINUED ON SHEET 7 OF 8

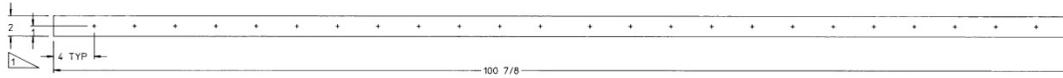
6 EA. $\begin{matrix} 4104 \\ 03 \end{matrix}$ $\begin{matrix} 4105 \\ 03 \end{matrix}$ SHEET, ALUM. 3003
11 GA. X 5 1/2 X 8'- 4 7/8" LG.



NEXT ASSEMBLY		TELENUMBER		REVISION		ZONE		CHG	APPROV
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION		
ORIGINAL		SUBMITTAL		1		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
TWO PLACES		TWO PLACES		2		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
PROVISIONAL		PROVISIONAL		3		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
AMALGAM		AMALGAM		4		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
SAFETY APPROVED		SAFETY APPROVED		5		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
FIELD SAFETY APPROVED		FIELD SAFETY APPROVED		6		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
FINAL APPROVAL		FINAL APPROVAL		7		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
TRACER		TRACER		8		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
OFTS CHECK		OFTS CHECK		9		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
PROBUDY DOING		PROBUDY DOING		10		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				11		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				12		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				13		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				14		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				15		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				16		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				17		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				18		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				19		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				20		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				21		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				22		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				23		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				24		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				25		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				26		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				27		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				28		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				29		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				30		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				31		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				32		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				33		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				34		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				35		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				36		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				37		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				38		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				39		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				40		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				41		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				42		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				43		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				44		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				45		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				46		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				47		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				48		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				49		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				50		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				51		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				52		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				53		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				54		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				55		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				56		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				57		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				58		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				59		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				60		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				61		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				62		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				63		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				64		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				65		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				66		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				67		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				68		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				69		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				70		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				71		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				72		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				73		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				74		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				75		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				76		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				77		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				78		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				79		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				80		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				81		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				82		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				83		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				84		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				85		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				86		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				87		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				88		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				89		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				90		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				91		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				92		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				93		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				94		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				95		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				96		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				97		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				98		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				99		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
				100		ARMAMENT, MUNITIONS & CHEMICAL COMMAND			

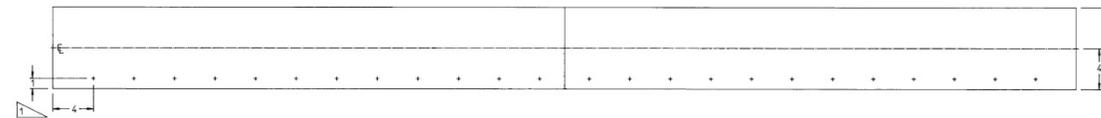
PARTS LIST				
PRT NO.	QTY	UNIT	NOMENCLATURE	PART NUMBER
2			CAP, END	SK884108
1			EXTENSION, COVER	SK884109

PARTS LIST CONTINUED ON 8 OF 8



2 REQ (4109) SHEET, ALUM. 3003
11 GA. X 1/2 1/2 X 100 7/8" LG.

NOTE:
1/4" SUGGESTED SPACING FOR SELF TAPPING SEALER SCREWS.



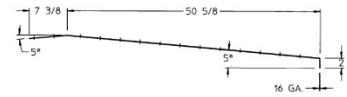
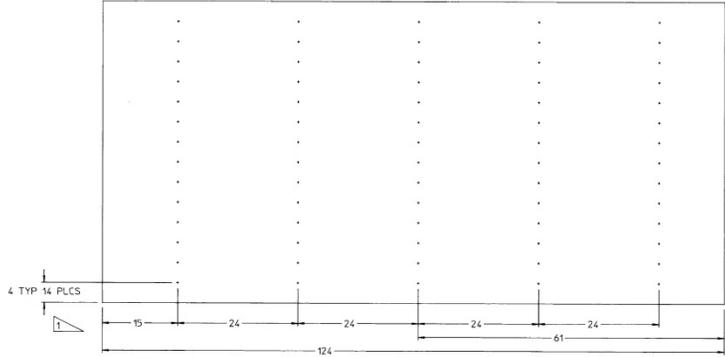
(4109) SHEET, ALUM. 3003
11 GA. X 8 X 101 1/2" LG.

SCANNED DWG

REV.	DATE	BY	DESCRIPTION	ZONE	CHKD	APPRD
SUBMITTED:			BY ARMY			
DESIGNED:			ARMAMENT, MUNITIONS & CHEMICAL COMMAND			
DRAWN:			ARMAMENT REGULAR EQUIPMENT			
CHECKED:			BURNING TRAY COVER			
PROJECT ENGINEER:			HEAVY PAN			
PROJECT MANAGER:			DETAILS			
DATE:			21824			
SCALE:			SK-88-41			
DATE:			19 JAN 95			
SCALE:			1/4"=1"			
DATE:			REV 7 OF 8			

PARTS LIST				
FIG NO.	QTY	UNIT	DESCRIPTION	PART NUMBER
2			SKIN, RIGHT SIDE COVER	SK884110
2			SKIN, LEFT SIDE COVER	SK884111
412	AS REQD		SCREW HEX SELF DRILL RUBBER WASHER 1/4 X 1/4 X 1 LG. NSN 1123900082Y698.	

NOTE:
 SUGGESTED SPACING FOR SELF TAPPING SEALER SCREWS.



2 REQ. (4110) ONE THIS
 SHEET, ALUM. 3003
 16 GA. X 60 X 122 LG.

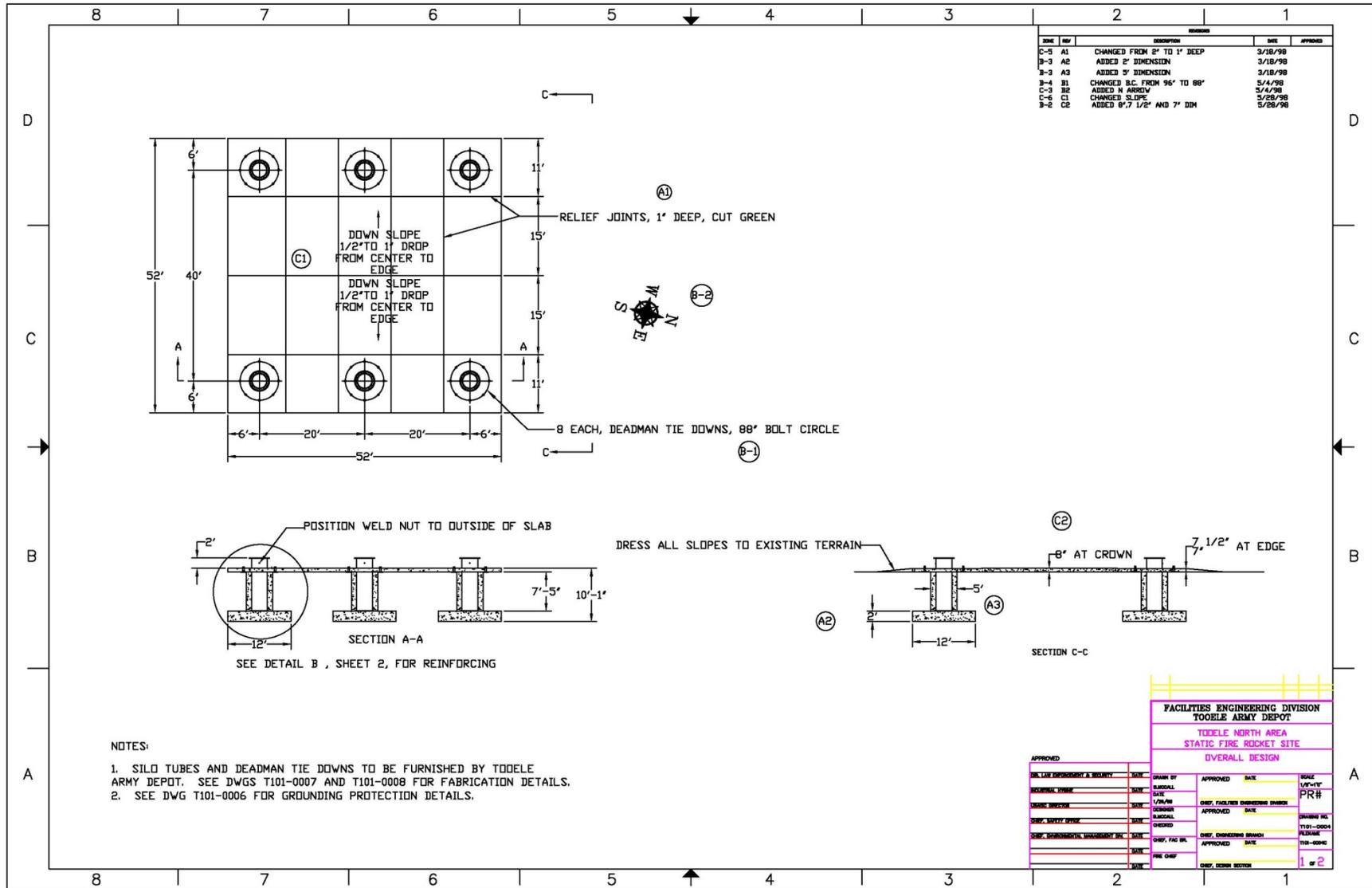
2 REQ. (4111) ONE OPPOSITE
 SHEET, ALUM. 3003
 16 GA. X 60 X 122 LG.

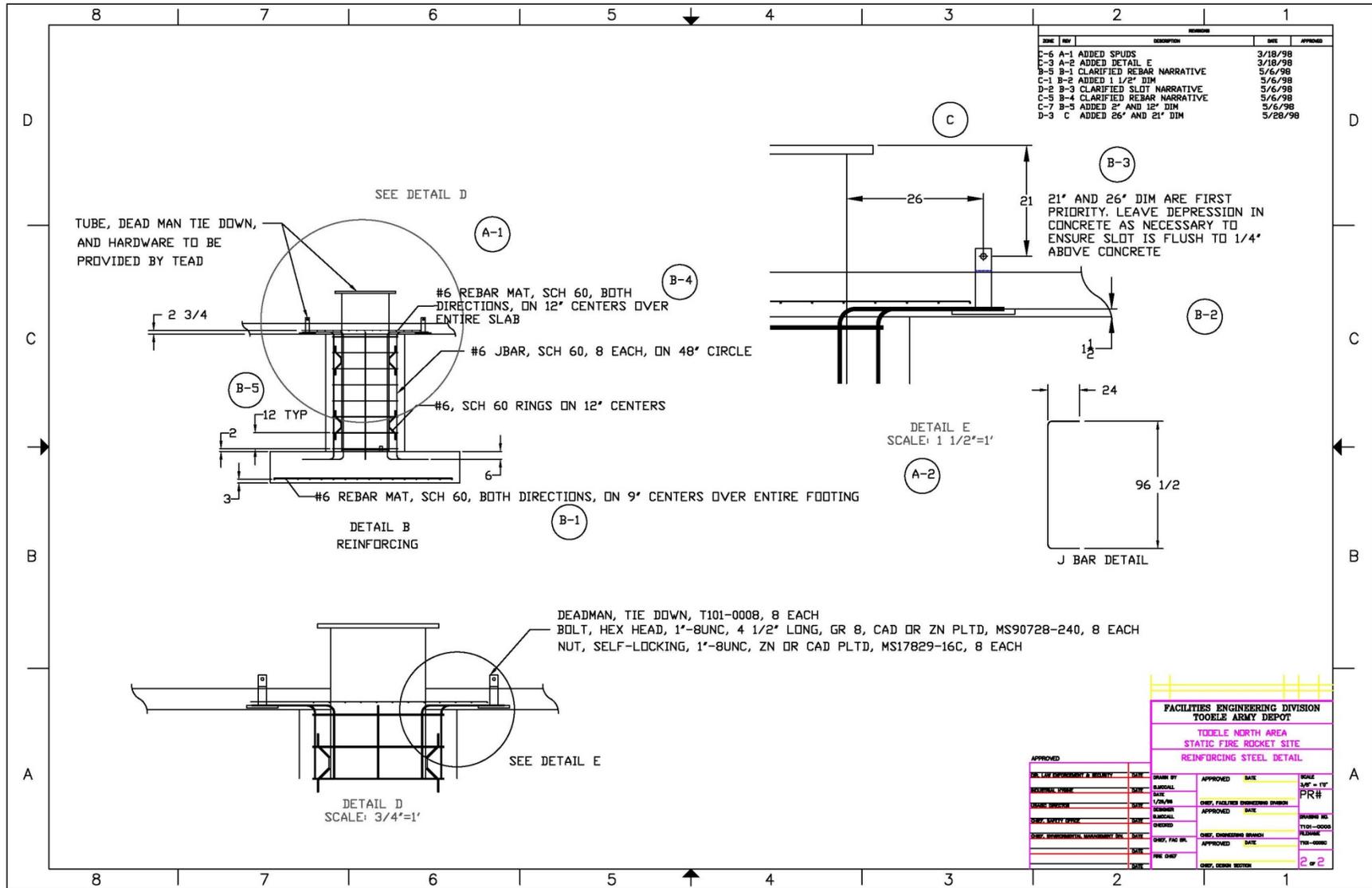
SCANNED DWG

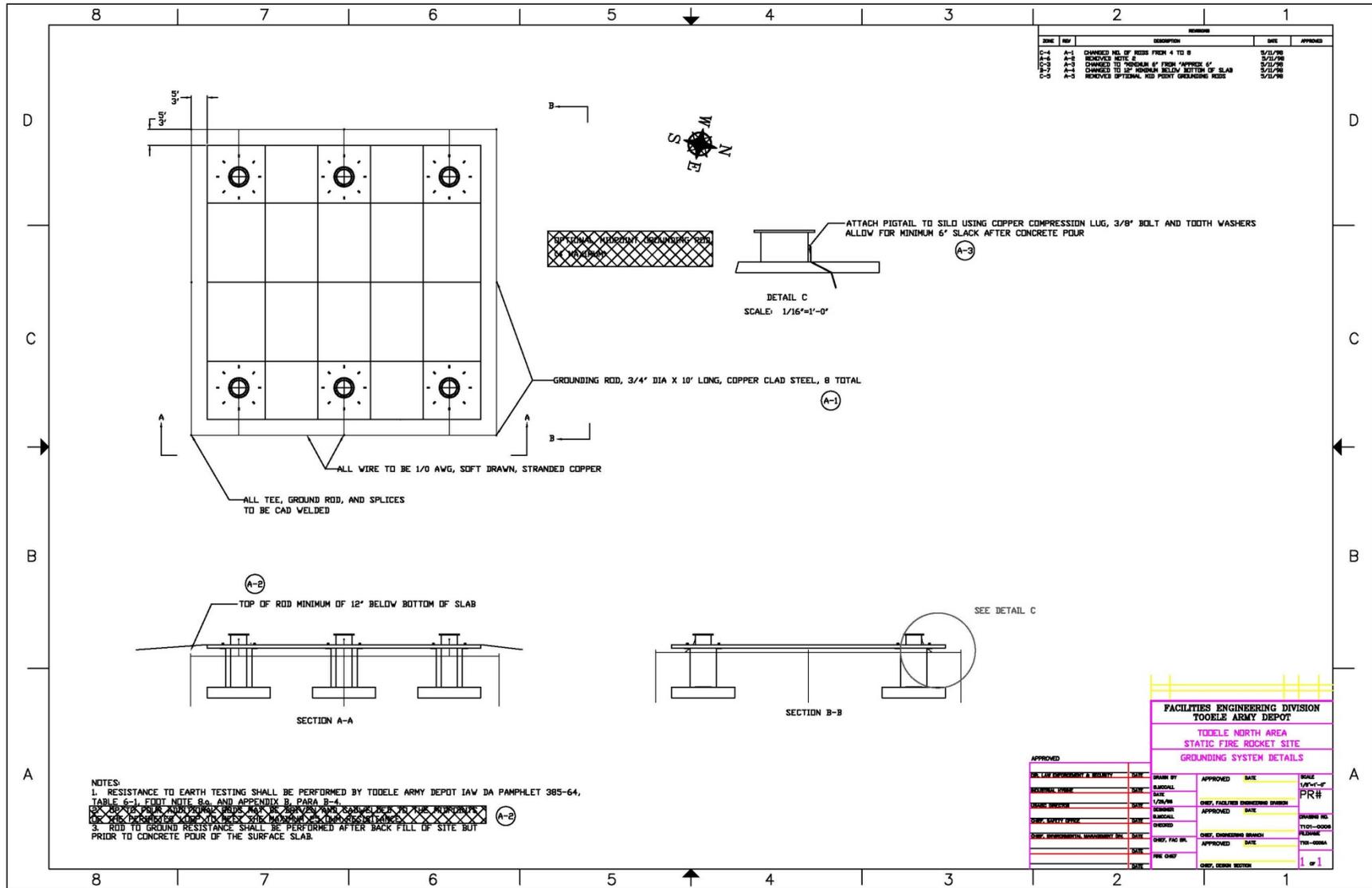
NEXT ASSEMBLY DESIGN: TYP. PLACES: 2, 3, 30 F. MARK: 0 30 SAFETY APPROVED TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS: IN UNLESS OTHERWISE SPECIFIED FINISH: UNLESS OTHERWISE SPECIFIED MATERIALS: UNLESS OTHERWISE SPECIFIED TYPICAL: UNLESS OTHERWISE SPECIFIED DIMENSIONS: UNLESS OTHERWISE SPECIFIED FINISH: UNLESS OTHERWISE SPECIFIED MATERIALS: UNLESS OTHERWISE SPECIFIED TYPICAL: UNLESS OTHERWISE SPECIFIED	REV. DATE BY DESCRIPTION ZONE CHG. APPR. 1 12 JAN 95 1/8-1 8 OF 8 DATE 12 JAN 95
---	--

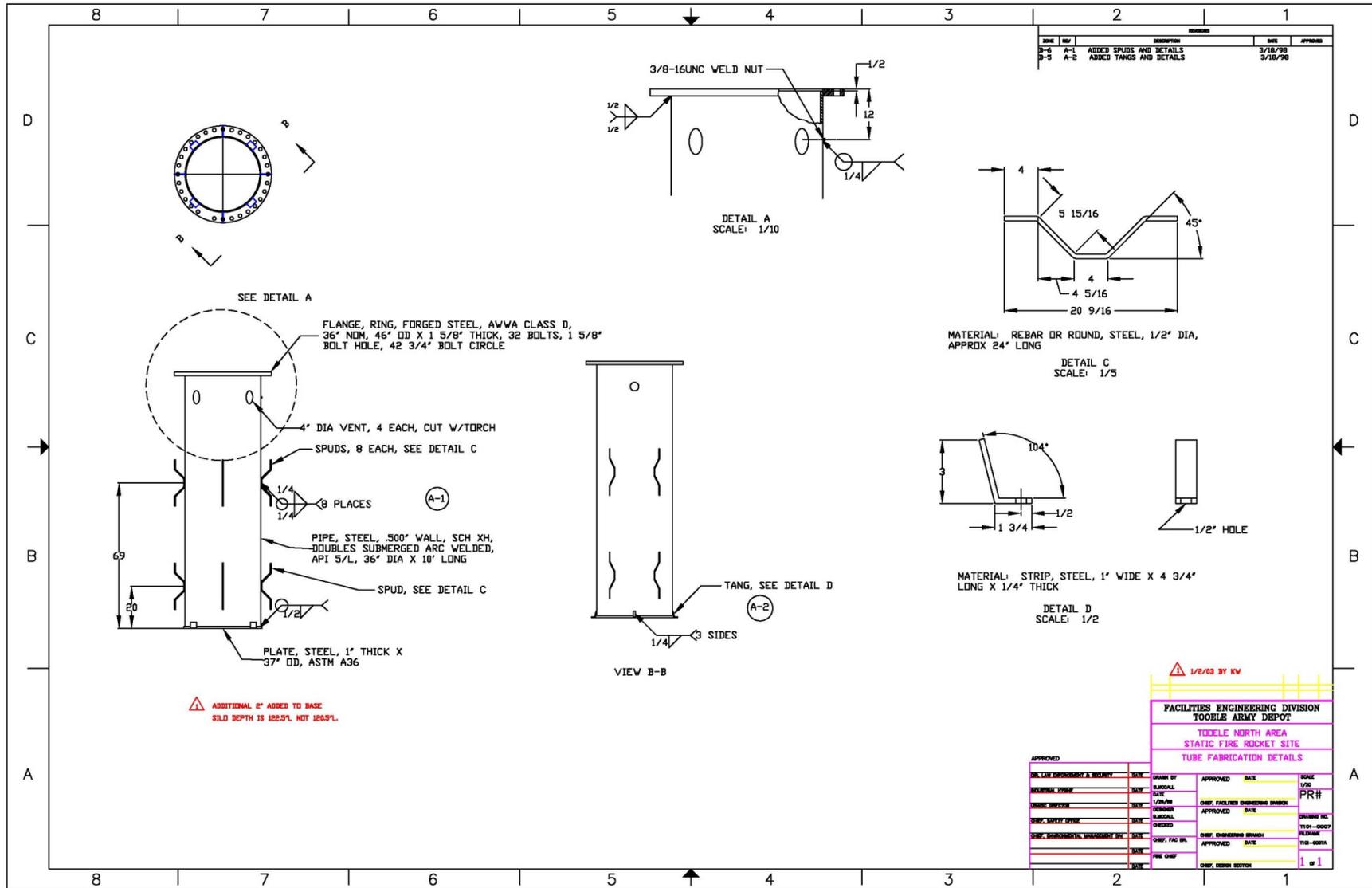
ARMAMENT, MUNITIONS & CHEMICAL COMMAND
 ARMAMENT PECULIA EQUIPMENT
 BURNING TRAY COVER
 HEAVY PAN
 DETAILS
 SK-88-41

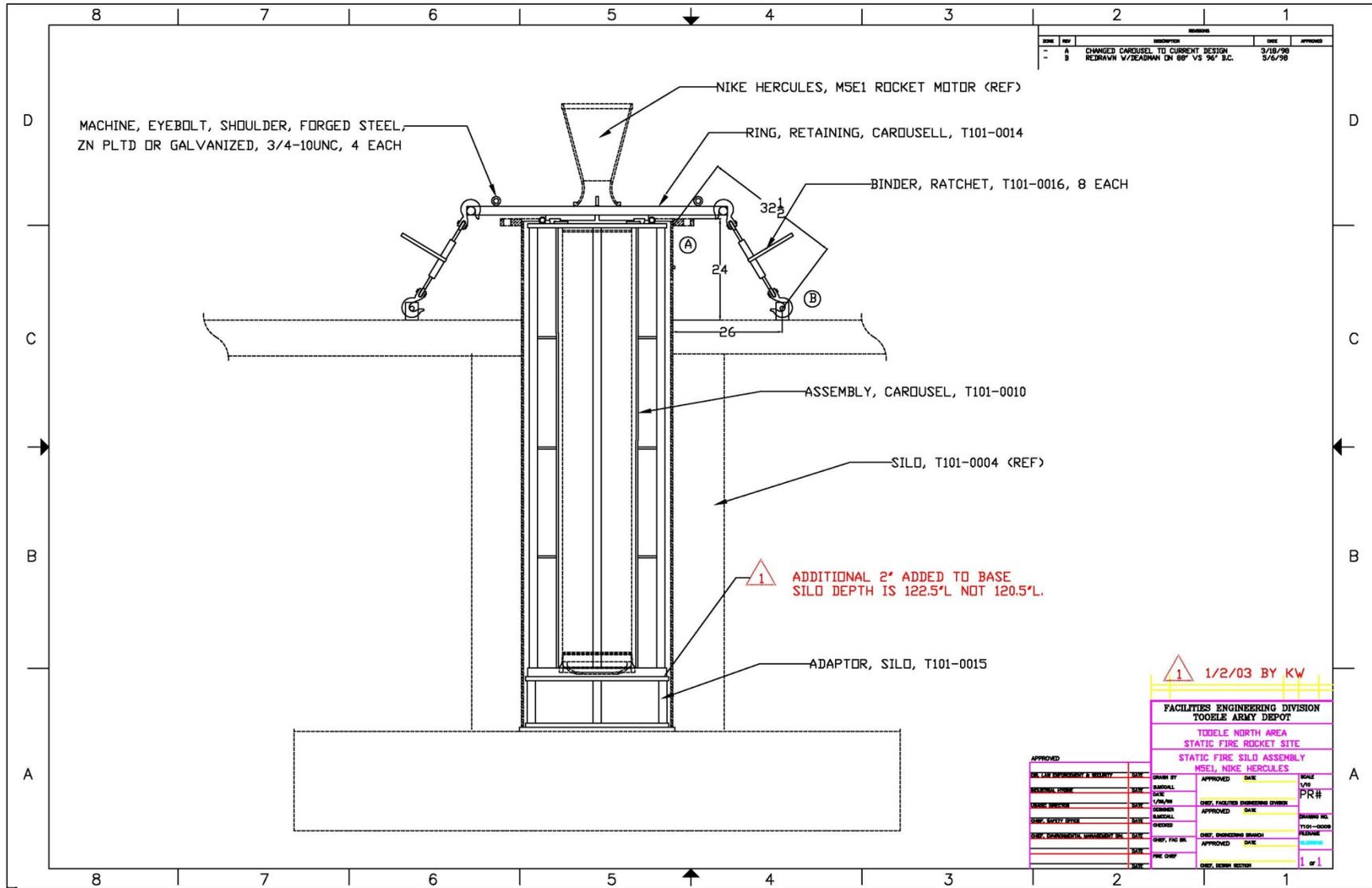
APPENDIX B
STATIC FIRE SILOS DRAWINGS



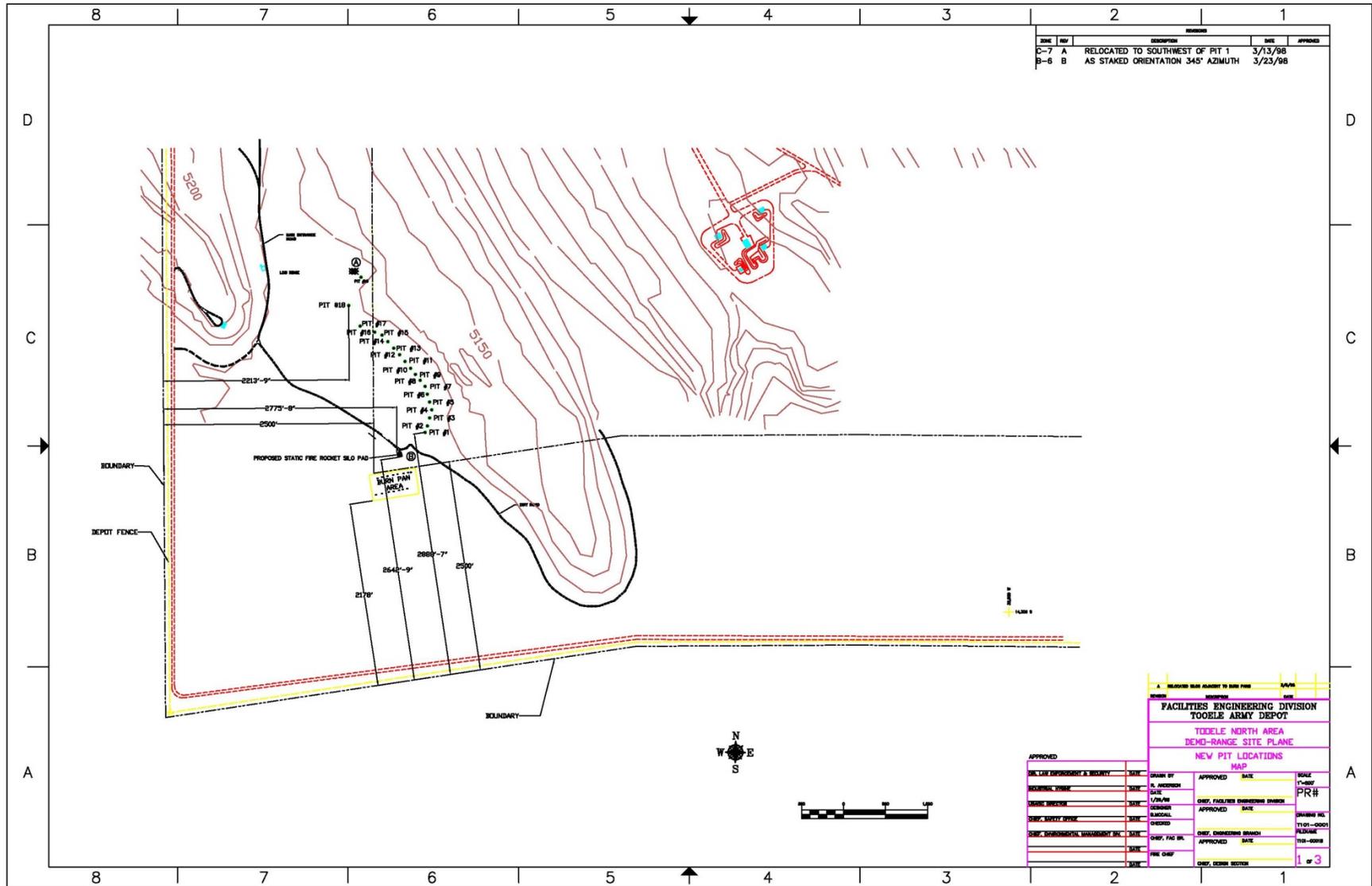








APPENDIX C
DETONATION PITS DRAWINGS



Attachment 16 – OB/OD Units
Tooele Army Depot

