



Demolish Catapults 108, 108A, 119, 159 and Building 205

At

Naval Air Station

Patuxent River, Maryland

BASIS OF DESIGN REPORT

Final Study Submission

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I. EXECUTIVE SUMMARY

A. GENERAL

Several abandoned structures at the Naval Air Station, Patuxent River, Maryland have been identified for potential demolition. Four of the structures are located on the airfield; Catapults 108, 108A, 119, and 159. The other structure is located near the southeast end of taxiway Echo off the airfield; Building 205.

The purpose of the project is to provide a study and cost estimate of how to demolish Catapults 108, 108A, 119, 159 and Building 205 without closing down the airfield during demolition. Demolition recommendations shall provide the most efficient and economical means of demolishing and filling the structures to eliminate large voided areas under the airfield.

B. STRUCTURAL DESCRIPTION

Catapult 108 is located at the intersection of taxiway Echo and Charlie. The entire structure is below grade with a tunnel portion extending under taxiway Echo to the existing catapult track located at approximately the center of the taxiway. The existing catapult track has been covered over by the current taxiway pavement; it is unclear whether the track was removed or remains in place below the pavement. The entire structure has approximately 5,300 SF of floor area with an additional 240 SF for a mechanical pit.

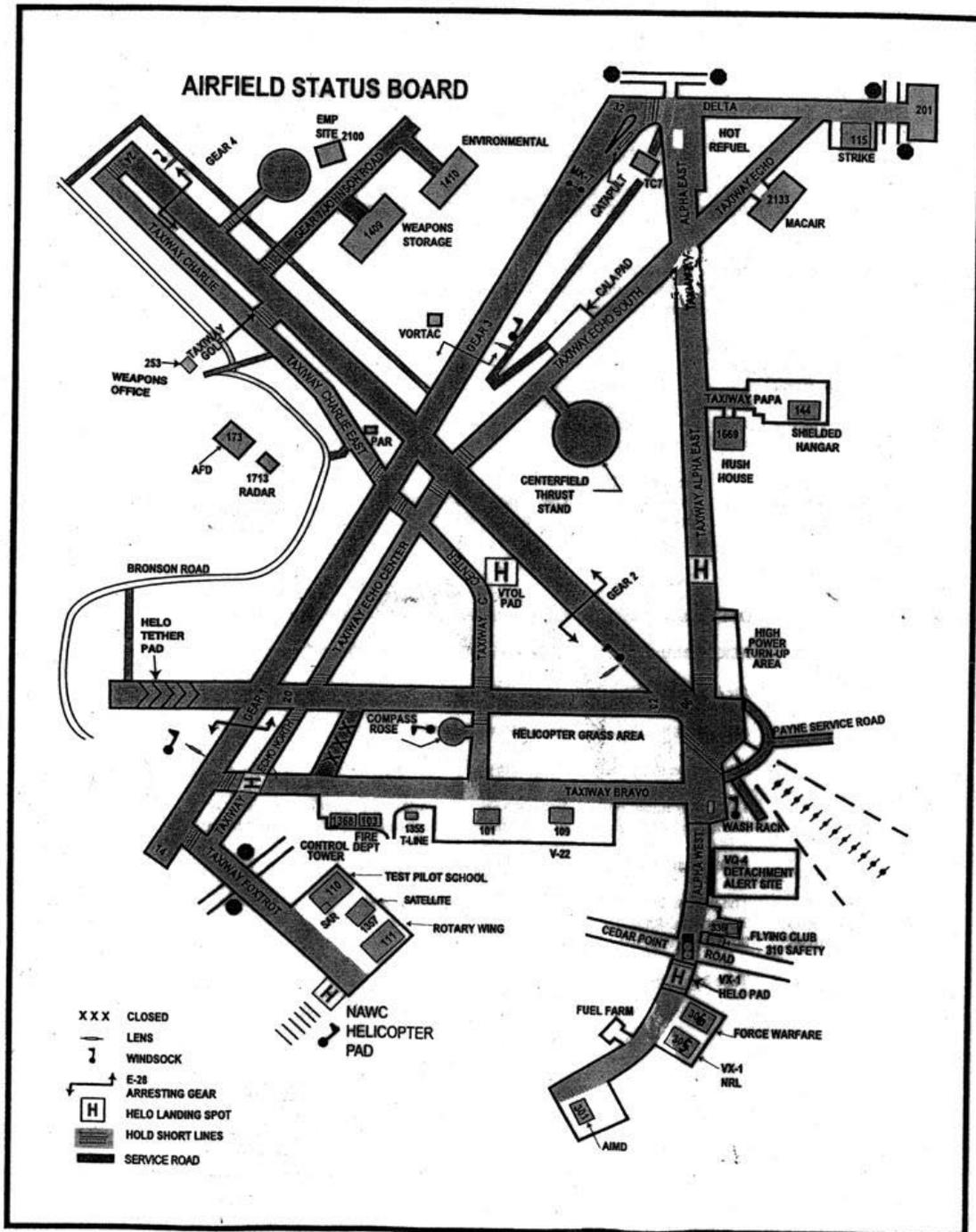
Catapult 108A was a semi-above ground control pit for Catapult 108. The pit is located approximately 125 feet away from the main hatch of Catapult 108 along taxiway Echo and covered with steel plate (five individual panels). It was used to control the catapult from outside the underground structure of Catapult 108.

Catapult 119 is located along taxiway Echo approximately halfway between taxiway Echo and runway 02-20. It is also located on the opposite side of taxiway Echo from Catapult 108 in the grass between taxiway Echo and runway 14-32. The original track was located between taxiway Echo and runway 14-32, however it appears to have been previously removed. The entire structure is below grade and has approximately 1,750 SF of floor area.

Catapult 159 is located in the overrun of runway 14-32 near Cedar Point Road. The entire structure is below grade. The existing track can still be found in the slab of the runway overrun. The structure consists of one large main building and then several satellite structures for the operation of the catapult. The main structure has approximately 8,250 SF of floor area with an additional 460 SF for a retrieving pit and 705 SF for a launching pit. Other pits exist in the structure, however they are shallow and under large pieces of equipment. A full set of existing building drawings were available for this structure, dimensions were spot verified during a site visit. All dimensions found below are from the existing building drawings.

Building 205 is located behind Strike at the end of taxiway Echo. Approximately half of the circular structure is underground and the observation tower is completely above grade. The structure has a footprint of approximately 925 SF. A centrifugal gun turret is mounted on top of the circular structure and able to rotate along a track. The circular

structure is donut shaped with the inner hole housing the equipment to rotate the turret. Access to the inner hole is through a hatch that opens to a ladder. The inner hole is approximately 65 SF (4'-6" radius). The outer ring of the donut is half filled with sand and now water and reeds. The outer ring is approximately 435 SF. The structure was used to test guns by shooting rounds into the sand; there is the possibility that the sand still contains live or inert ammo as large as 50 caliber.



C. EXISTING CONDITIONS

All of the structures still house heavy machinery, electrical and mechanical equipment, abandoned utilities, and some minor furnishings.

The underground catapult structures were flooded and had to be dewatered during this study phase. Dewatering of the structures had to comply with Navy and Maryland Department of the Environment (MDE) restrictions and regulatory requirements.

Despite the flooded conditions, the structures are generally in sound condition. There were no indications of areas that are structurally unstable and in risk of failure.

Hazardous materials have been identified in all of the structures except for Catapult 108A. A detailed report of the testing and findings are contained in Appendices H thru L.

D. DEMOLITION RECOMMENDATIONS

Catapults 108, 108A, and 119 all are within the Runway Lateral Clearance Zone of runway 14-32. Catapult 159 is within the Approach-Departure Clearance Zone of runway 14-32. Therefore, demolishing catapults 108, 108A, 119, and 159 will require that all work be performed at night when runway 14-32, taxiway Echo and potentially taxiway Charlie can be shutdown.

Building 205 is not located on the airfield, it is located behind Strike. Access will need to be coordinated with Strike. Demolition work at Building 205 can be performed during normal working hours.

The general suggested sequence of demolition for Catapults 108, 119, and 159 is as follows:

1. Dewater the structure, if required.
2. Abate all hazardous materials.
3. Remove all equipment and debris.
4. Core drill large multiple holes in the floor slabs to allow free movement of ground water.
5. Fill the structure with compacted #57 stone.
6. When the stone level is within three (3) feet of finished grade, demolish the structure to three (3) feet below finished grade, fill remaining depth with #57 stone, and cover with temporary concrete panels or steel plates.
7. Remove temporary covers and construct permanent pavement.

The entire concrete structure of Catapult 108A and Building 205 shall be removed from the site.

E. CONCLUSIONS

Demolition activities of Catapult 108, 108A, 119, and 159 will need to be coordinated with Air Operations and demolition activities of Building 205 must be coordinated with Strike. Demolition of the structures located on the airfield will be required to happen during night work. It should be anticipated that the structures will be flooded with some amount of water and will need to be dewatered again during the demolition phase. Dewatering will likely need to be maintained throughout the demolition of the structures. The dewatering process must comply with the regulations and testing requirements of both the Navy & MDE. The presence of water in the catapults may create Confined Space conditions that will also impact the contractor. Hazardous materials have been identified and hazardous material abatement will be required prior to equipment removal and demolition. Detailed reports of existing hazardous material conditions can be found in Appendices H to L.

The most efficient and economical means of demolition for each structure is as follows:

1. For Catapults 108, 119, and 159: demolish the top of the structure down to three (3) feet below finished grade, backfill, and pave.
2. For Catapult 108A and Building 205: demolish the entire structure.

II. GENERAL

A. List of Buildings and Locations

1. Several abandoned structures at the Naval Air Station, Patuxent River, Maryland have been identified for potential demolition. Four of the structures are located on the airfield, Catapults 108, 108A, 119, and 159. The other structure is located near the southeast end of taxiway Echo off the airfield, Building 205.
2. Catapult 108 housed an old hydraulic catapult at the intersection of taxiway Echo and Charlie. The track ran down the middle of taxiway Echo. Catapult 108A was a control pit for Catapult 108 along taxiway Echo. Catapult 108 was the smaller of the two hydraulic catapults located on the airfield.
3. Catapult 119 housed an electric catapult called the 'electropult' built by Westinghouse. It is located along taxiway Echo about halfway between runway 02-20 and taxiway Charlie. The track ran between taxiway Echo and runway 14-32.
4. Catapult 159 housed an hydraulic catapult at the 14 end of runway 14-32 in the current overrun of the runway. The track ran down the middle of runway 14-32.
5. Building 205 was used to test guns and determine why certain ones were jamming. The building is located on Nicholas Road behind Strike.

B. Purpose of Study

1. Purpose of the project is to provide a study and cost estimate of how to demolish Catapults 108, 108A, 119, 159 and Building 205 without closing down the airfield during demolition. Demolition recommendations shall provide the most economical means of how to demolish and fill the structures.
2. Sampling and testing of each structure for hazardous materials was performed and a description of materials that may be encountered during demolition can be found in the appendices H to L.
3. Field surveys were completed to document/verify existing structures to aid in developing a demolition plan and cost estimate. Existing building drawings were only available for Catapult 159 and Building 205.

- each space tight to the underside of the roof slab. The concrete roof slab is estimated to be 8 inches thick. The shared wall with the control room is 17 inches thick, the shared wall with the main room is 12 inches thick, the other two walls of the space are exterior walls and estimated to be 12 inches thick. An aircraft engine occupies approximately 60 percent of the floor area. Along the north wall behind the engine is an air intake shaft with a metal door. In the eastern corner of the room near the door to the main room, an additional exhaust room is located which houses two (2) turbines. The room was inaccessible due to the louvers; however Photograph 32 in Appendix C is of the turbine.
7. The exhaust room is located adjacent to the control room and the main room; it is approximately 55 SF (8'-9" by 6'-2"). Connected to the south of the room is an air exhaust shaft that ducts exhaust from the main room generators up to finished grade thru metal grating. The shaft is approximately 45 SF (2'-6" by 17'-3"). The floor to ceiling height is approximately 11'-0". One (1) concrete beam is located near the center of the room and is 12 inches wide with a depth of 19 inches to the underside of the concrete roof slab. The concrete roof slab is estimated to be 8 inches thick. The shared wall with the control room is 17 inches thick, the shared walls with the main room are 8 inches thick and the other walls are estimated to be 12 inches thick.
 8. Adjacent to the structure along the southeast wall is an underground fuel tank. The tank is inaccessible, however based on a slab outline at grade the estimated plan dimensions of the tank are 10'-0" by 32'-9".

D. Catapult 159

1. Catapult 159 is located in the overrun of runway 14-32 near Cedar Point Road. The entire structure is below grade. The existing track can still be found in the slab of the runway overrun. The structure consists of one large main building and then several satellite structures for the operation of the catapult. The main structure has approximately 8,250 SF of floor area with an additional 460 SF for a retrieving pit and 705 SF for a launching pit. Other pits exist in the structure, however they are shallow and under large pieces of equipment. A full set of existing building drawings were available for this structure. Dimensions were spot verified during a site visit. All dimensions found below are from the existing building drawings. See Appendix D for photographs and Appendix F for structural drawings.
2. The structure has two (2) entrances which are both large hatches opening to metal staircases. The staircases are steel channels with open grate treads and are in good condition; however several of the treads are bent.
3. The structure is a mix of cast-in-place concrete construction and structural steel framing. The structure has ten (10) main rooms, two large mechanical pits, and several hallways. The eastern hatch leads into the machine shop room, while the western hatch leads into one of the hallways. A third hatch which is located closest to Cedar Point Road leads into the holdback pit, one of the satellite structures. The structural steel framing occurs in the large main room which houses the hydraulic catapult. The remaining structure is cast-in-place concrete walls, beams, slabs, and columns with several infill masonry walls.
4. Upon entering the western hatch into the hallway, the room to the east is a fan room with an exhaust shaft. The fan room is approximately 125 SF (6'-6" by 19'-2").

- floor to ceiling height is approximately 11'-0". Three of the walls are 10 inches thick and the wall separating the fan room from the office is 12 inches thick. A masonry wall with a door divides the room in half and separates the equipment from the exhaust shaft. The concrete roof slab is 10 inches thick and the concrete floor slab is 8 inches thick.
5. Adjacent to the fan room is the office which has a restroom in the east corner. The office is approximately 380 SF (19'-9" by 19'-4"), of that 40 SF (6'-5" by 6'-2") is the restroom. The floor to ceiling height is approximately 11'-0". The northwest and southwest walls are 12 inch cast-in-place concrete while the other walls are 8 inch masonry infill. An 18 inch square column is located in the masonry restroom wall. The roof structure is a 10 inch concrete slab supported by concrete beams. The concrete beams are 16 inches wide and vary in depth from 18 inches to 20 inches deep to underside of the concrete roof slab. The concrete floor slab is 8 inches thick. The room is mostly empty with miscellaneous MEP equipment/boxes mounted on the walls and a toilet in the restroom.
 6. Adjacent to the office is the storage room, which is the largest of several storage rooms. The storage room is approximately 310 SF (16'-0" by 19'-4"). The floor to ceiling height is approximately 11'-0". The southwest wall is a 12 inch cast-in-place concrete, the southeast wall is an 8 inch cast-in-place concrete wall, and the other walls are 8 inch masonry infill. An 18 inch square column built into the southeast wall. The roof structure is a 10 inch concrete slab supported by concrete beams. The concrete beams are 16 inches wide and vary in depth from 18 inches to 20 inches deep to underside of the concrete roof slab. The concrete floor slab is 8 inches thick. The room has several pieces of electrical equipment along the southeast wall, piping for a drainage sump and sewage pit along the southwest wall and a workbench along the northwest wall.
 7. Adjacent to the storage room is the transformer room. The transformer room is approximately 380 SF (19'-9" by 19'-4"). The floor to ceiling height is approximately 11'-0". All the walls are 8 inch cast-in-place concrete except the southwest wall which is 12 inches thick. An 18 inch square column is near the southeast wall. The roof structure is a 10 inch concrete slab supported by concrete beams. The concrete beams are 16 inches wide and vary in depth from 18 inches to 20 inches deep to the underside of the concrete roof slab. The concrete floor slab is 8 inches thick. The room houses two rows of transformers which take up a majority of the space. Additionally there are several miscellaneous MEP equipment/boxes mounted on the walls.
 8. Adjacent to the transformer room are two rooms; the restroom with a shower and the tool room. The restroom is accessible from the center hallway while the tool room is accessible from the machine room. The restroom is approximately 55 SF (9'-2" by 6'-2") and the tool room is approximately 115 SF (9'-2" by 12'-6"). The floor to ceiling height is approximately 11'-0". The northwest wall of both rooms is shared with the transformer room which is an 8 inch cast-in-place concrete wall. The southwest wall of the tool room is a 12 inch cast-in-place concrete wall. The remaining walls for both rooms are 8 inch masonry infill walls. The roof structure is a 10 inch concrete slab supported by concrete beams. The concrete beams are 16 inches wide by 18 inches deep to the underside of the concrete roof slab. The concrete floor slab is 8 inches thick. A toilet, shower and wall mounted mechanical fan are located in the

- restroom. A desk and shelving are located in the tool room along with several miscellaneous MEP boxes mounted on the walls.
9. At the end of the center hallway adjacent to the restroom and tool room is the machine room. Along the southwest wall of the machine room is access to the eastern hatch and staircase. The machine room is approximately 615 SF (23'-8" by 26'-0"). The floor to ceiling height is approximately 11'-0". All the walls are 12 inch cast-in-place concrete except the northwest wall which is an 8 inch masonry wall. An 18 inch square column is near the northwest wall. The roof structure is a 10 inch concrete slab supported by concrete beams. The concrete beams are 16 inches wide and vary in depth from 18 inches to 20 inches deep to the underside of the concrete roof slab. The concrete floor slab is 8 inches thick. The room is mostly empty with miscellaneous MEP equipment/boxes mounted on the walls, a water fountain, a water heater, and shelves.
 10. The structure has two hallways, one along the northwest end of the structure and one down the center of the structure. The hallway along the northwest end of the structure is L-shaped and approximately 440 SF (6'-0" wide, 73'-10" long). The floor to ceiling height of the hallway along the northwest end of the structure is approximately 7'-0". The hallway along the center of the structure is approximately 450 SF (6'-0" wide, 75'-0" long). The floor to ceiling height of the hallway along the center of the structure is approximately 11'-0".
 11. The first small storage room is located along the end hallway past the center hallway when entering the western hatch. The first small storage room is approximately 80 SF (6'-6" by 12'-4"). The floor to ceiling height is approximately 7'-0". The wall between the storage room and the main room is 12 inch cast-in-place concrete, the other three (3) walls are 10 inch cast-in-place concrete. The roof structure is a 10 inch concrete slab. The room is empty.
 12. The second small storage room is located at the end of the northwest hallway on the opposite side of the structure from the western hatch. The second small storage room is approximately 45 SF (6'-4" by 6'-10"). The floor to ceiling height is approximately 7'-0". The northwest and southeast walls are 12 inch cast-in-place concrete while the northeast and southwest walls are 10 inch cast-in-place concrete. The roof structure is a 10 inch concrete slab. The room is mostly empty with a fan located in the southeast wall.
 13. The main room is located in the south corner of the structure; the two mechanical pits are accessible from the main room via ladders. The main room is approximately 4,745 SF (113'-8" by 39'-6, with several alcoves). The floor to ceiling height is approximately 11'-0". The northwest and southwest walls adjacent to rooms or hallways are 12 inch cast-in-place concrete. The northeast wall is 18 inch cast-in-place concrete. The southwest and southeast walls supporting soil are 15 inch cast-in-place. The roof structure consists of a low level of steel beams which span between steel columns and the concrete walls to form a support grid. The support beams are 16WF or 18WF steel beams. Rectangular roof panels are on top of the support beams, each roof panel consists of steel channels around the perimeter with the flange turned towards the interior of the panel, steel beams span the short direction between the channels, steel plate span between the beams. The perimeter channels of the panels are bolted to the support beams. The panels can be lifted out as a complete unit. The concrete floor slab is 8 inches thick, except over the

- launching and retrieving pits which consist of steel beams and steel plates. The main room houses the hydraulic catapult engine and associated tanks and cabling. Also in the room are six (6) large hydraulic tanks, a small tank, a compressor and motor, two (2) large mechanical pieces of equipment, control board for the catapult, piping and other miscellaneous MEP equipment/boxes. The pumps which were hooked up to the hydraulic tanks have been removed, along with several large tanks.
14. The launching pit is the larger of the two (2) pits and located adjacent to the machine room. The launching pit is approximately 705 SF (31'-8" by 22'-3"). The floor to ceiling height is 11'-0". The walls are 12 inch cast-in-place concrete. The floor structure above is a series of steel beams and channels framing out the openings for the large hydraulic tanks and steel plate around the tanks. Access to the launching pit is by a ladder located in the south corner of the space. Five (5) large hydraulic tanks are located in the space, with half the tank above the floor structure above and half the tank hanging below the floor structure above. The space original housed seven (7) hydraulic tanks, however two (2) of the tanks have already been removed. Other than the hydraulic tanks, the space houses a large compressor and motor, piping, and other miscellaneous MEP equipment/boxes.
 15. The retrieving pit is the smaller of the two (2) pits and located in the west corner of the main room across from the office and large storage room. The retrieving pit is approximately 460 SF (38'-0" by 12'-2"). The floor to ceiling height is 7'-6". The walls are 12 inch cast-in-place concrete. The floor structure above is a series of steel beams and channels framing out the openings for the large hydraulic tanks and steel plate around the tanks. Access to the launching pit is by a ladder located in the center of the space along the wall of the main room. One (1) large hydraulic tank is located in the space. Other than the hydraulic tank, the space houses piping and other miscellaneous MEP equipment/boxes.

E. Building 205

1. Building 205 is located behind Strike at the end of taxiway Echo. Approximately half of the circular structure is underground and the observation tower is completely above grade. The structure has a footprint of approximately 925 SF. See Appendix E for photographs and Appendix F for structural drawings.
2. A centrifugal gun turret is mounted on top of the circular structure and able to rotate along a track. The circular structure is donut shaped with the inner hole housing the equipment to rotate the turret. Access to the inner hole is through a hatch that opens to a ladder. The inner hole is approximately 65 SF (4'-6" radius). The outer ring of the donut is half filled with sand, water, and reeds. The outer ring is approximately 435 SF. The structure was used to test guns by shooting rounds into the sand; there is the possibility that the sand still contains live or inert ammo as large as 50 caliber. Access to the turret is from the second level, which is currently only accessible from the ladder in the observation tower. A sliding metal grate spans from an 80 SF concrete balcony over to the inner ring where the turret is located.
3. Adjacent to the circular structure outside the door to the observation tower is a manhole. The manhole has a floor area of approximately 14 SF (3'-6" by 4'-0") and is 11'-0" deep.

IV. DEMOLITION RECOMMENDATIONS

A. General Demolition Requirements

1. Catapults 108, 108A, and 119 all are within the Runway Lateral Clearance Zone of runway 14-32. Catapult 159 is within the Approach-Departure Clearance Zone of runway 14-32. Therefore, demolishing catapults 108, 108A, 119, and 159 will require that all work be performed at night when runway 14-32, taxiway Echo and potentially taxiway Charlie can be shutdown. The contractor must be made responsible for developing a work schedule that is coordinated with Air Operations personnel and updated weekly. The contractor will need to take into consideration that they will not be granted access to the airfield to work on nights when Air Operations requires runway 14-32 to be operational.
2. Building 205 is not located on the airfield, it is located behind Strike. Access to the site shall be coordinated with Strike. The contractor must be made responsible for developing a work schedule that is coordinated with Strike personnel and updated weekly. Demolition work at Building 205 can occur during normal working hours.
3. All cranes and construction equipment must be removed from the airfield when contractor has completed work each day. The government must designate a contractor laydown area close to the airfield. Cranes used during demolition shall be the mobile crane type, crawler and tower cranes will not be allowed. The contractor must also be made responsible to fix any damage to the taxiways or runways created by the contractor's equipment.
4. All openings created in catapult structure roofs for the purpose of removing equipment shall be covered over at the end of each work day. All FOD (Foreign Object Debris) must be removed from demolition sites at the end of each work day.
5. The contractor will be required to follow the requirements of the EM 385-1-1 and any additional requirements of the Patuxent River Naval Air Station.
6. Working on the airfield will impose significant additional restrictions on working conditions that the contractor may not be familiar with.
7. Dewatering of the catapults is unique from normal construction dewatering and is subject to significant environmental restrictions. Information contained in Appendices H to L would be helpful to the contractor in preparing a dewatering plan.

B. Suggested Crane Requirements

1. A crane will be required to be used during the demolition of Catapults 108, 119, 159 and Building 205. Cranes used during demolition on the airfield shall be the mobile crane type and will be required to be removed from the airfield at the end of each work day.
2. To help develop a basis for demolition, a maximum lift was limited to 4-tons. Because the crane will be required to be removed from the airfield each day, the crane location around the catapults can change, thus reducing the maximum lift radius required. Catapult 159 is the basis for selecting a crane for the basis of this report. The maximum lift radius for Catapult 159 is approximately 80 feet.

3. A crane that meets the requirements set forth above is the Liebherr Mobile Crane LTM 1030-2.1. Product data can be found in Appendix G. At 80 feet, the LTM 1030-2.1 has a lifting capacity of 4-tons. This information is only to confirm the feasibility of performing the work and is not intended to dictate the crane to be used during demolition. The contractor shall be responsible for selecting an appropriate crane to perform the demolition work.

C. Backfill Requirements

1. All fill material shall be placed in maximum loose lifts of 8-inches and shall be compacted to dry densities of at least 95 percent of the standard proctor maximum dry density, ASTM D-698.
2. Suggested fill material shall be #57 stone. However, government may direct the contractor to use recycled concrete salvaged from runway and taxiway replacement projects provided the recycled concrete is properly graded prior to use.
3. Fill material shall provide an appropriate level of drainage and not trap water inside the existing structure.
4. Fill material shall be placed on both sides of interior walls simultaneously with a differential fill elevation no greater than one (1) foot.
5. Geofoam suggested to be used in lieu of #57 stone to fill the tunnel extensions of catapults 108, 119, and the holdback pit tunnel of 159.

D. Dewatering Restrictions

1. The maximum pumping rate will be limited to 100 gallons per minute (gpm) and must be pumped directly into grated storm drains.
2. Pollution Prevention Monitoring will be required and must comply with the applicable parameters in the Navy's NPDES permit. A more detailed discussion of what monitoring was required for this study can be found in Appendices H thru L.

E. Catapult 108

1. Dewatering, abatement of hazardous material, or other activities required shall be completed prior to removal of equipment and demolition of the structure.
2. The top of the roof structure is flush with the surrounding pavement. A portion of the roof structure is constructed out of removable concrete panels, each approximately seven (7) foot square and weighing nearly 3-tons. The removal panels are located over a majority of the equipment.
3. The suggested sequence of demolition is as follows:
 - a. Dewater the structure, if required.
 - b. Abate all hazardous materials.
 - c. Remove all equipment and debris.

- c. Remove all equipment and debris.
 - d. Core drill multiple large holes in the floor slab to allow free movement of the ground water.
 - e. Fill the structure with compacted #57 stone.
 - f. When the stone level is within three (3) feet of finished grade, demolish the structure to three (3) feet below finished grade, fill remaining depth with #57 stone, and cover with temporary concrete panels or steel plates.
 - g. Remove temporary covers and construct permanent pavement.
4. The size and weight of equipment removal ultimately is the responsibility of the contractor. For the purpose of the study, equipment was estimated to be removed in lifts no greater than 4-tons. The contractor shall be responsible for cutting up the equipment into the appropriate sizes to fit through the contractor cut opening(s) in the roof structure and not exceeding the 4-ton weight limit.
 5. During backfilling operations, the contractor shall take special precaution to cover #57 stone with heavy steel plates at the end of each work day to protect against FOD during regular airfield operations.
 6. Removal of the roof structure to three (3) feet below finished grade shall be limited to the amount of work that can be completed during a work day to allow the closing up of the work site at the end of the work day. Areas of exposed loose gravel fill will not be permitted.
 7. Steel columns, concrete columns, and concrete walls more than three (3) feet below finished grade shall remain in place once the top has been removed.
 8. The entire tunnel extension that extends out into the infield will remain in place and may be filled with geofom as an alternative to #57 stone.

H. Catapult 159

1. Dewatering, abatement of hazardous material, or other activities required shall be completed prior to removal of equipment and demolition of the structure.
2. The top of the roof structure is flush with the surrounding pavement. Portions of the roof structure are constructed out of removable steel panels, each approximately 140 SF (10'-4" by 13'-5") and weigh nearly 3.7-tons. The removal panels are located over a majority of the equipment in the main room. An additional removable panel is located in the machine room and the transformer room.
3. The suggested sequence of demolition is as follows:
 - a. Dewater the structure, if required.
 - b. Abate all hazardous materials.
 - c. Remove all equipment and debris.
 - d. Core drill multiple large holes in the floor slab to allow free movement of the ground water.
 - e. Fill the structure with compacted #57 stone.

- f. When the stone level is within three (3) feet of finished grade, demolish the structure to three (3) feet below finished grade, fill remaining depth with #57 stone, and cover with temporary concrete panels or steel plates.
 - g. Remove temporary covers and construct permanent pavement.
 4. The size and weight of equipment removal ultimately is the responsibility of the contractor. For the purpose of the study, equipment was estimated to be removed in lifts no greater than 4-tons. The contractor shall be responsible for cutting up the equipment into the appropriate sizes to fit through the existing openings in the roof structure and not exceeding the 4-ton weight limit.
 5. During backfilling operations, the contractor shall take special precaution to cover #57 stone with heavy steel plates at the end of work days to prevent FOD during regular airfield operations.
 6. Removal of the roof structure to three (3) feet below finished grade shall be limited to the amount of work can be completed during a work day to allow the closing up of the work site at the end of the work day.
 7. Steel columns, concrete columns, and concrete walls more than three (3) feet below finished grade shall remain in place once the top has been removed.
 8. Additionally, the holdback pit concrete structure shall remain in place. The steel plating and supporting steel beams at grade shall be removed. The entire pit shall be filled with #57 stone. The tunnel access to the holdback pit may be filled with geofoam as an alternative to #57 stone.
- I. Building 205
 1. Dewatering, abatement of hazardous material, or other activities required shall be completed prior to removal of equipment and demolition of the structure.
 2. The entire concrete structure of Building 205 shall be removed from the site.
 3. The suggested sequence of demolition is as follows:
 - a. Dewater the structure, if required.
 - b. Abate all hazardous materials.
 - c. Remove all equipment and debris.
 - d. Demolish the entire concrete structure.
 - e. Backfill excavation with compacted #57 stone.
 - f. Provide sod on top of the #57 stone to match surrounding site.
 4. The contractor shall maintain the roadway adjacent to the building. The roadway is approximately 20 feet from the face of the building; therefore demolition of the structure should be achievable using a 1:1 layback of the soil.

V. CONCLUSIONS

- A. Demolition activities for Catapult 108, 108A, 119, and 159 will need to be coordinated with Air Operations and demolition activities for Building 205 must be coordinated with Strike.
- B. The demolition of the catapult structures located on the airfield will be required to happen during night work to minimize the impact on flight operations.
- C. It should be anticipated that the structures will be flooded with some amount of water and will need to be dewatered again during the demolition phase. Water infiltrates back into the structures when dewatering activities cease therefore, dewatering will likely need to be maintained throughout the demolition of the structures. The dewatering process must comply with the regulations and testing requirements of both the Navy & MDE. The presence of water in the catapults may create Confined Space conditions that will also impact the contractor.
- D. Hazardous materials have been identified and hazardous material abatement will be required prior to equipment removal and demolition. Detailed reports of existing hazardous material conditions can be found in Appendices H to L.
- E. The most efficient and economical means of demolition for each structure is as follows:
 - 1. For Catapults 108, 119, and 159: demolish the top of the structure down to three (3) feet below finished grade, backfill, and pave.
 - 2. For Catapult 108A and Building 205: demolish the entire structure.

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APPENDIX D

Catapult 159 – Photographs

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Appendix D – Catapult 159 Photographs



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18

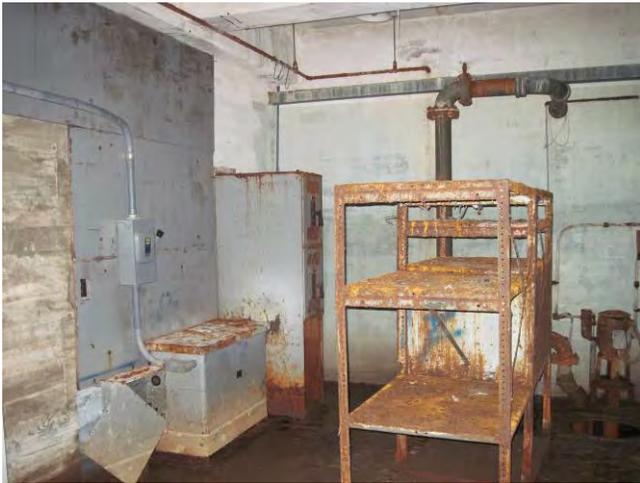


Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27

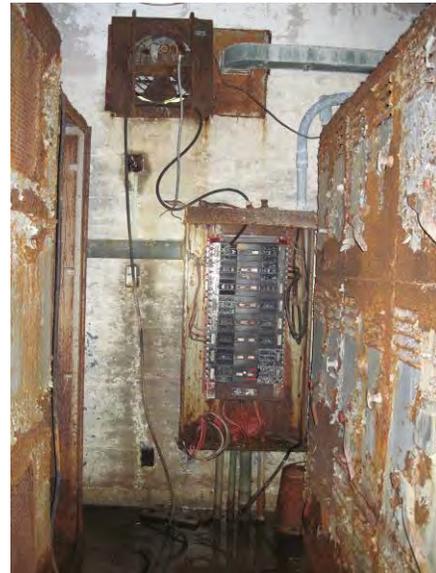


Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43

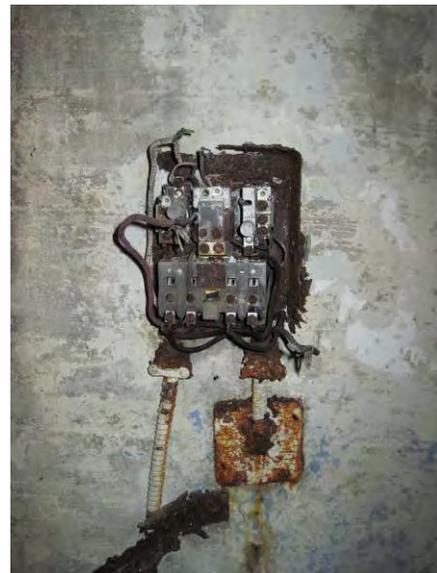


Photo 44



Photo 45



Photo 46



Photo 47



Photo 48



Photo 49



Photo 50



Photo 51



Photo 52



Photo 53



Photo 54



Photo 55



Photo 56



Photo 57



Photo 58



Photo 59



Photo 60



Photo 61



Photo 62



Photo 63



Photo 64



Photo 65



Photo 66



Photo 67



Photo 68



Photo 69



Photo 70



Photo 71

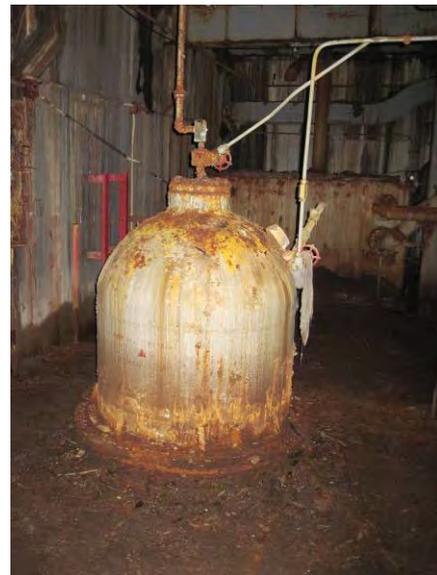


Photo 72



Photo 73



Photo 74



Photo 75



Photo 76



Photo 77



Photo 78



Photo 79



Photo 80



Photo 81



Photo 82



Photo 83



Photo 84



Photo 85



Photo 86



Photo 87



Photo 88



Photo 89



Photo 90



Photo 91



Photo 92



Photo 93



Photo 94



Photo 95



Photo 96



Photo 97



Photo 98



Photo 99



Photo 100



Photo 101



Photo 102



Photo 103



Photo 104



Photo 105



Photo 106



Photo 107



Photo 108



Photo 109



Photo 110



Photo 111

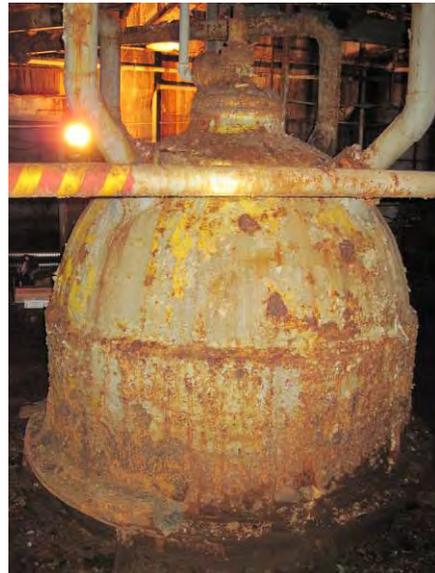


Photo 112



Photo 113



Photo 114



Photo 115



Photo 116



Photo 117



Photo 118



Photo 119



Photo 120



Photo 121



Photo 122



Photo 123



Photo 124



Photo 125



Photo 126



Photo 127



Photo 128



Photo 129



Photo 130



Photo 131



Photo 132



Photo 133



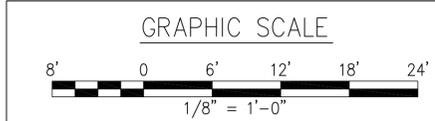
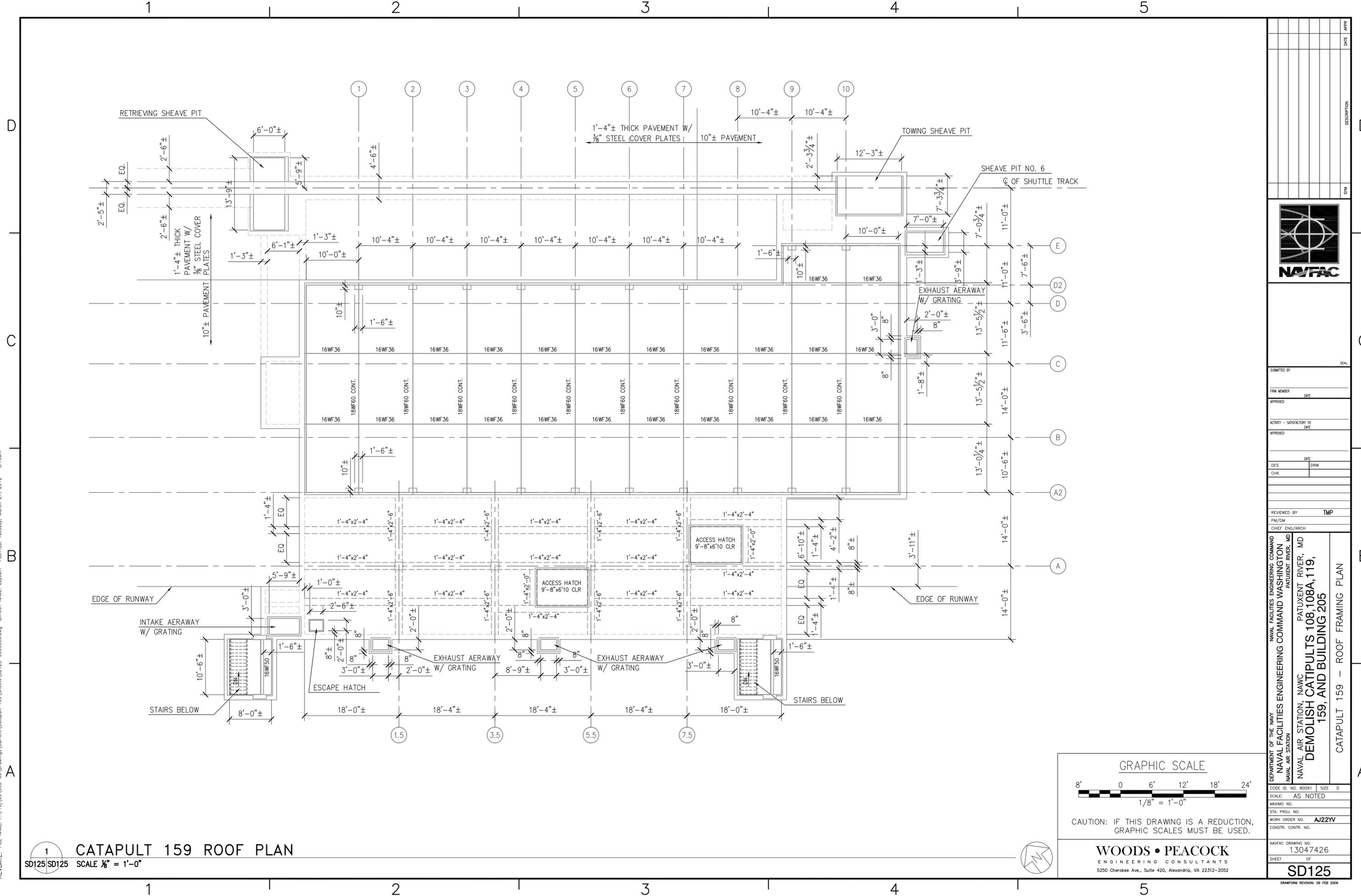
Photo 134

APPENDIX F

Structural Drawings

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CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

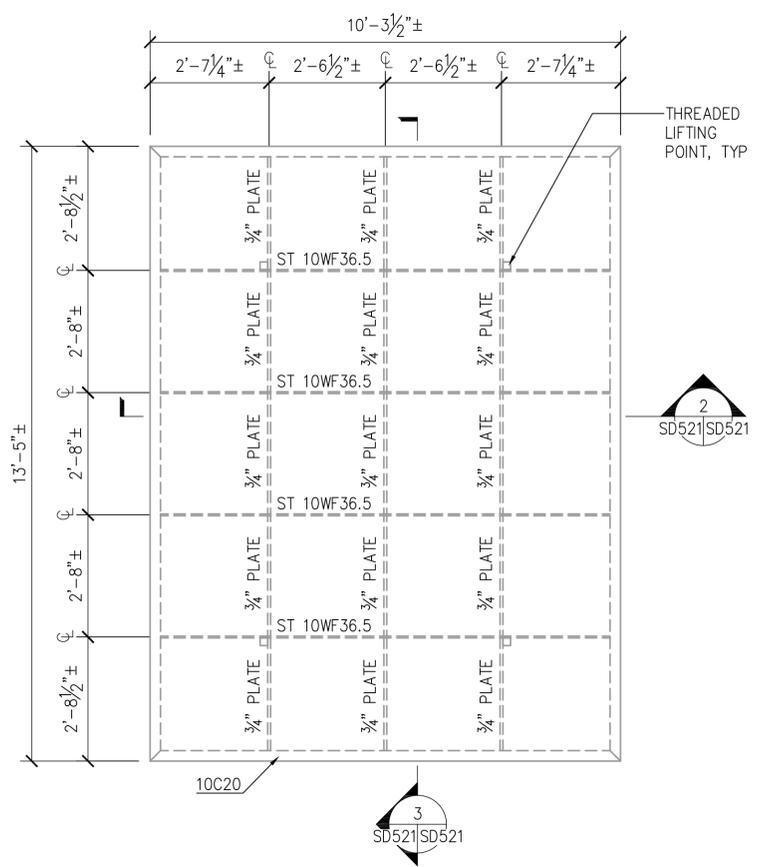
1 CATAPULT 159 ROOF PLAN
 SD125 SD125 SCALE 1/8" = 1'-0"



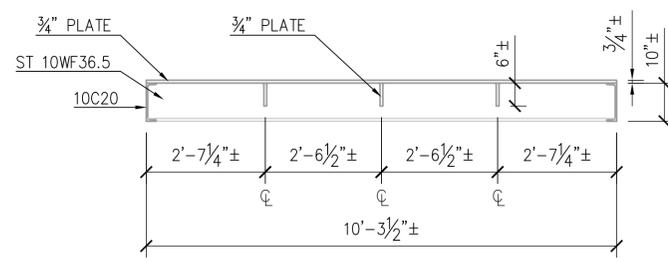
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 5250 Cherokee Ave., Suite 420, Alexandria, VA 22312-2052

 NAVFAC	SUBMITTED BY: _____ FROM MEMBER: _____ DATE: _____ APPROVED: _____ ACTIVITY - SATISFACTORY TO DATE: _____ APPROVED: _____ DATE: _____ DES: _____ CHK: _____ REVIEWED BY: TMP PM/DM: _____ CHIEF ENG/ARCH: _____
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON NAVAL AIR STATION PATUXENT RIVER, MD NAVAL AIR STATION, NAWC DEMOLISH CATAPULTS 108, 108A, 119, 159, AND BUILDING 205 CATAPULT 159 - ROOF FRAMING PLAN	
CODE ID NO. 80091 SIZE D SCALE: AS NOTED MAXIMO NO. _____ STA. PROJ. NO. _____ WORK ORDER NO. AJ22YV CONSTR. CONTR. NO. _____	
NAVFAC DRAWING NO. 13047426 SHEET OF _____ SD125 <small>DRAWING REVISION: 09 FEB 2006</small>	

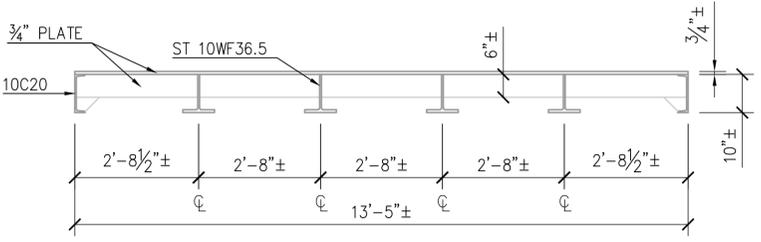
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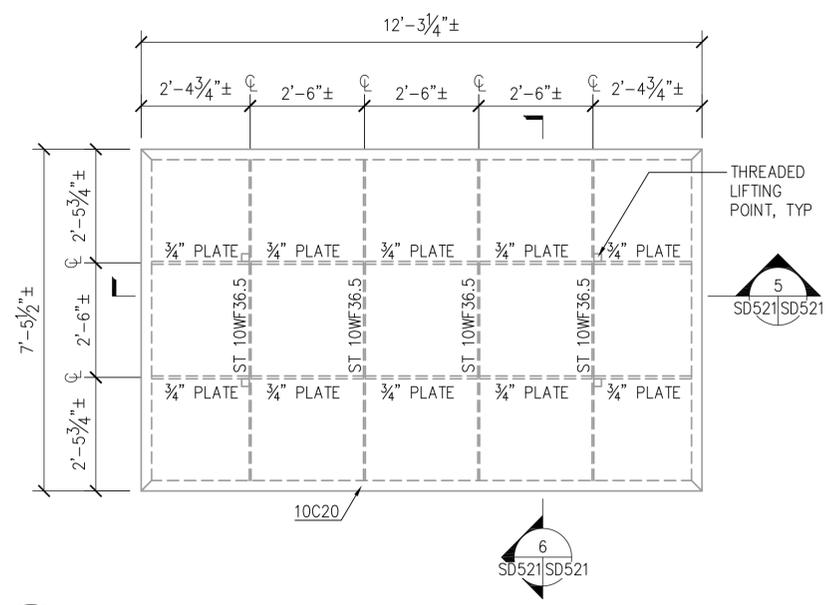
1 HATCH "A" DETAIL PLAN
SD521|SD521 SCALE 1/2" = 1'-0"



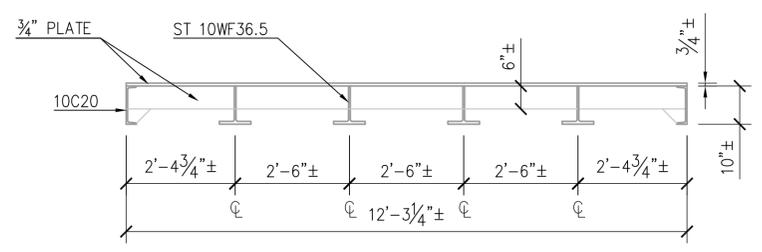
2 HATCH "A" SECTION
SD521|SD521 SCALE 1/2" = 1'-0"



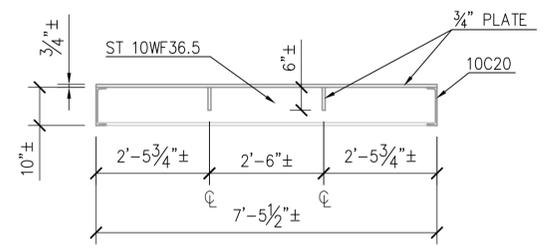
3 HATCH "A" SECTION
SD521|SD521 SCALE 1/2" = 1'-0"



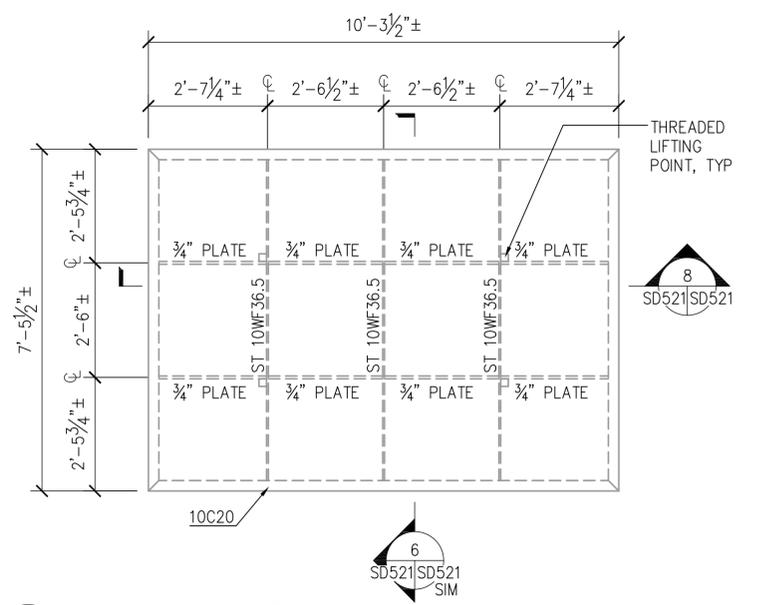
4 HATCH "B" DETAIL PLAN
SD521|SD521 SCALE 1/2" = 1'-0"



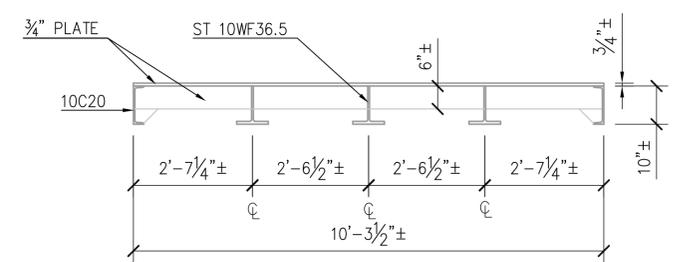
5 HATCH "B" SECTION
SD521|SD521 SCALE 1/2" = 1'-0"



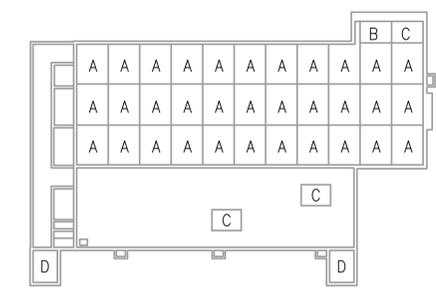
6 HATCH "B" SECTION
SD521|SD521 SCALE 1/2" = 1'-0"



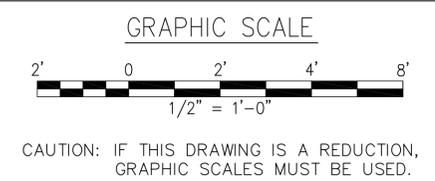
7 HATCH "C" DETAIL PLAN
SD521|SD521 SCALE 1/2" = 1'-0"



8 HATCH "C" SECTION
SD521|SD521 SCALE 1/2" = 1'-0"



9 HATCH LAYOUT DIAGRAM
SD521|SD521 SCALE 1" = 30'-0"



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	<p>DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL AIR STATION NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON PATUXENT RIVER, MD NAVAL AIR STATION, NAWC PATUXENT RIVER, MD DEMOLISH CATIPULTS 108, 108A, 119, 159, AND BUILDING 205 CATAPULT 159 - HATCH DETAILS</p>
<p>DATE: _____ SYN: _____ DESCRIPTION: _____</p>	<p>DATE: _____ SYN: _____ DESCRIPTION: _____</p>
<p>REVIEWED BY: TMP FM/DM CHIEF ENG/ARCH</p>	
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<p>DRAWING REVISION: 09 FEB 2006</p>	

