



## Excavations and Intrusive Earthwork

### Overview

---

**In This Section** This section provides an overview of the Excavation process and serves as an aid to assist contractors and subcontractors with NNS Excavation and Intrusive Earthwork Procedures and contains the following subsections:

- Purpose
  - Applicability
- 

**Purpose** The purpose of this document is to provide guidance for current, as well as, prospective contractors needed to perform work in excavations so they are aware of their responsibilities and understand how to perform the work safely.

Serious hazards exist for all employees who work in trenching and excavations. While trench collapses, or cave-ins, pose the greatest risk to workers' lives, various hazardous energy sources are located under the ground at Newport News Shipbuilding. Examples of such energy sources include electricity, steam, radiological concerns, compressed air and other gases.

Other materials and equipment are located under the ground, which if disturbed could cause substantial expense and down time for both the contractor and NNS. Because of the magnitude and diversity of NNS operations, the potential for such personal injury and/or facility damage is pronounced.

In response, contractors and NNS personnel who oversee contractor operations shall have guidance to intrusive earthwork activities.

---

**Applicability** This document applies to all contractor and subcontractor operations who manage or perform excavations and intrusive earthwork within shipyard properties either owned or leased by Huntington Ingalls Industries – Newport News Shipbuilding (HII-NNS).

HII-NNS properties located inside the shipyard property boundary, which are owned, leased, and/or operated by HII, require an NNS Excavation Permit.

---

*Continued on next page*



## Overview, continued

---

**Applicability,**  
*(continued)* HII-NNS properties located inside the shipyard property boundary within 10 feet of a Virginia Natural Gas or Hampton Roads Sanitation District line that are owned, leased, and/or operated by HII-NNS requires an NNS Excavation Permit and a VA811 ticket to be submitted.

HII-NNS properties located outside of the shipyard property boundary which are owned, leased, and/or operated by HII-NNS require both an NNS Excavation Permit and must also submit a VA811 ticket.

---



## Acronyms and Terms

Term	Definition	Acronym
Contractor	Any legal entity contracting with NNS to perform production work on NNS property or on a NNS-controlled worksite. This includes entities contracting directly with NNS or indirectly through another entity (Prime or General Contractor), that has a contract directly or indirectly with NNS.	-----
Contractor Coordinator	An NNS employee or approved subsidiary employee monitoring production, construction and installation of work performed, including quality of workmanship, environmental, health and safety and scheduling of work performed by a NNS contractor and it's lower tier subcontractors.	CC
Excavation or Intrusive Earthwork	Any operation in which earth, rock, or other material in the ground is moved, removed, or otherwise purposely displaced by means of any tools or equipment and includes without limitations: saw-cutting, grading, trenching, digging, ditching, drilling, tunneling, scraping, cable and driving, pile driving, moving or removing any structure or mass of material. Also if performing any concrete demolition and/or penetration work (saw cutting, jack hammering, drilling, etc.)	-----
Excavation Mailbox	An enclosure designed to house the Excavation Package to include Excavation Permit, excavation maps, and any special precautions/documents relating to the excavation job.	-----
Excavation Maps	A map generated by O46 GIMMS team that displays the shipyard, excavation site boundaries, associated buildings and all known utilities. Used to supplement the markings on the ground and further identify where utilities may be located.	-----
Excavation Permit Requester	An NNS employee or approved subsidiary employee monitoring production, construction and installation of work performed, including quality of workmanship, environmental, health and safety and scheduling of work performed by a NNS contractor and it's lower tier subcontractors.	-----
Facilities Excavation Permit	A form (NN9372) that contains the following information: Requestors contact information, approvals from environmental, Roads & Grounds, Piping, Electrical, Communications, RadCon and Safety. This form must be present at the excavation site for excavation work to begin and must remain valid on-site until backfilled.	-----

*Continued on next page*



## Acronyms and Terms, Continued

<b><u>G</u>eographic <u>I</u>nformation <u>M</u>anagement &amp; <u>M</u>apping <u>S</u>ervices</b>	Geographic Information Management & Mapping Service is a team within O46 that supports the maintenance of the GIMMS data that is used to display utility lines on map products.	<b>GIMMS</b>
<b><u>G</u>round <u>P</u>enetrating <u>R</u>adar</b>	A tool that uses radar pulses (electromagnetic radiation in the microwave band of radio spectrum) to image the subsurface and detect the reflected signals from subsurface structures.	<b>GPR</b>
<b><u>H</u>untington <u>I</u>ngalls <u>I</u>ndustries, <u>N</u>ewport <u>N</u>ews <u>S</u>hipbuilding</b>	An unincorporated division of Huntington Ingalls Industries, Inc., a wholly owned subsidiary of Huntington Ingalls Industries, Inc.	<b>HII-NNS</b>
<b><u>N</u>ewport <u>N</u>ews <u>S</u>hipbuilding</b>	An unincorporated division of Huntington Ingalls incorporated, a wholly owned subsidiary of Huntington Ingalls Industries, Inc.	<b>NNS</b>
Offset Markings	An added set of marks placed on the closest permanent surface such as asphalt and concrete indicating how far the underground utility lines are from that point. Utilities are still required to mark the actual location of the underground facility, and the offset markings typically run parallel to the actual marked lines. The offset should be marked with an arrow indicating the distance from that point to the actual marked line.	----
<b><u>P</u>roject <u>C</u>oordinator</b>	The lead person in charge of construction activities, including the quality, Environmental, Health and Safety performance of work being performed by a contractor. This person may be titled as (but not limited to) Planner, Scheduler, Contractor Coordinator, Foreman, Construction Engineer, Field Engineer, Excavation Permit Requester etc.	<b>PC</b>
<b><u>R</u>adiological <u>C</u>ontrol</b>	The department that controls the radiological aspects of the shipyard.	<b>RadCon</b>
Site Sketch	A sketch/plan showing the scope of the proposed excavation site and all known detected utilities, underground tanks, buildings, areas and/or items of concern, etc., in the excavation site. This sketch is developed from actual underground utility locating efforts (known as designation).	----
Soft Digging	Any excavation tools or equipment that utilizes air or water pressure as the direct means to break up soil or earth for removal by vacuum.	----
Spotter	Any person assigned by the Excavation Supervisor to observe digging performed by heavy machinery and to alert the operator of any potential exposure to utility lines.	----
VA811	An agency that coordinates marking of the utilities of their Member Organizations Inside/outside boundaries of NNS property.	----



## Compliance with Regulations and NNS References

---

### Local, State and Federal

Contractors are required to comply with the Occupational Safety and Health Administration's (OSHA) requirements for excavations in 29 Code of Federal Regulations (CFR) 1926, Subpart P and all applicable local, state and federal regulations.

### NNS References

- SSP F-1004, Excavation (Digging) Procedures on Newport News Shipbuilding Property
  - SSW F-1004.1, Instructions for Obtaining Excavation Permits
  - SSP F-1091, Requirements for Handling Excavation Soil on Newport News Shipbuilding Property
  - SWI E-2, Excavation Equipment Swing Radius.
- 

## Excavation Requirements

---

### In This Section

This section describes the requirements for any contractor who may be involved with any operation which earth, rock, or other material in the ground is moved, or otherwise purposely displaced by means of any tools or equipment and includes the following subsections:

- Examples of Disturbance
- 

### Examples of Disturbance

Examples of disturbance includes without limitations:

- Intrusive concrete penetration
  - Saw Cutting
  - Grading
  - Trenching
  - Digging
  - Drilling
  - Tunneling
  - Scraping
  - Driving (installing electrical ground rods or foundation piling, etc.)
  - Auguring (soil boring and installing storm anchors, etc.)
- 

*Continued on next page*



## Excavation Requirements, Continued

---

**Examples of Disturbance,**  
*(continued)*

Examples of disturbance includes without limitations:

- Concrete demolition and/or penetration work (saw cutting, jack hammering, drilling, etc.)
  - Moving or removing any structure or mass of material
-



## Excavation Key Steps

---

**In This Section** This section describes the steps required when Contractor personnel are exposed to Excavations activities and includes the following subsections:

- Key Steps
  - Additional Controls
- 

### Key Steps

- Work with the appropriate NNS Contractor Coordinator to secure a Facilities Excavation Permit.
- Mark or map the area to identify each location to be disturbed.
- Do not start operations until the permit is secured and posted at the site.
- Cease or not start operations if, in the judgement of the Contractor, the Excavation Permit is inadequate or incomplete. Look for evidence of unmarked utility lines.
- Ensure all personnel at the excavation site have received and understand any special instruction prior to digging.
- If performing any concrete demolition and/or penetration work (Saw cutting, Jack hammering, Drilling, etc.) ensure site has been GPR prior to excavation and information is communicated from GPR crew to Excavation crew.
- Ensure all information from GPR, marking, NNS personnel system knowledge, updated drawings, excavation maps, and site sketch for underground utilities location and depth are communicated to the excavation supervisor and crew.
- Ensure utility markings remain legible throughout the excavation process and request remark in the event the markings are removed or faded.
- Do not assume that an underground utility line runs straight between line markers.
- Do not assume the depth of a utility line and an underground utility line is at the same depth throughout the entire route of the excavation.
- Use a spotter if heavy excavation machinery is used at the excavation site. Spotters shall not be assigned additional duties while acting as a spotter.
- **Do not use mechanized equipment within two (2) feet of utility line markings.** If excavation activities are required near a marked utility line, carefully expose the utility line by hand or soft digging techniques and keep mechanized at least two (2) feet away from the line at all times.
- Stop all excavations (digging) at the site, and informs the appropriate Contract Coordinator that an obstruction or utility line has been discovered that is not on the GIMMS Map, Site Sketch, or Markings.
- All personnel know the proper procedures to follow if utility signs are discovered or damaged during the digging process.
- Ensure that the permit is reissued at least every 35-calendar days for as long as the excavation operations continue.

---

*Continued on next page*



## Excavation Key Steps, Continued

---

### Additional Controls

In some areas of the shipyard, additional controls are required due to the potential presence of asbestos or other hazardous materials in the excavation area. In these cases, your Contractor Coordinator will advise you on permissible and prohibited activities. Where necessary, a third party contractor will be utilized to ensure that environmental and industrial hygiene concerns are controlled and/or abated.

---





## Determining GPR Survey Requirements

**In This Section** This section provides instructions for meeting the criteria and satisfying any applicable GPR Requirements and includes the following subsections:

- How to Meet GPR Survey Requirements

**How to Meet GPR Survey Requirements** This subsection provides the instructions needed to satisfy applicable GPR requirements and responsibilities of the Excavation Permit Requestor to determine if Excavation is exempt from GPR and GPR survey procedures. (Steps 1 - 2 of 4)

Steps	Action
<b>GPR Requirement Steps</b>	
1.	<p><b>GPR is REQUIRED</b> on ALL Excavation jobs if performing any concrete demolition and/or penetration work (saw cutting, jackhammering, drilling, etc.) <b>EXCEPT</b> at these specific cases:</p> <ul style="list-style-type: none"> <li>• The penetration must occur as part of the same project that poured the concrete and;</li> <li>• The PC has maintained control of the concrete as follows:                             <ul style="list-style-type: none"> <li>- Has not left the job site exceeding 30 days or;</li> <li>- Has restricted access to the site to prevent use by others and;</li> <li>- No utilities are placed in the immediate vicinity of the penetration within the concrete when it was poured and;</li> <li>- No evidence exists of utilities installed after the initial pour.</li> </ul> </li> <li>• Intrusion in moveable concrete structures (trench covers, keel blocks, “jersey barriers”, etc.).</li> <li>• Intrusion in structural concrete members such as concrete piles under piers, crane rails or concrete columns in buildings.</li> <li>• Intrusions in elevated concrete platforms with no utility lines entering or leaving the concrete</li> <li>• Intrusions in the main utility tunnel floor only (there are no utilities in the tunnel’s concrete that do not pass through the walls).</li> <li>• Intrusions with depth of four (4) inches or less in concrete needed for the replacement only of a fastener (i.e. anchor bolt, concrete screw, etc.). A replacement fastener of equal length and within one (1) increment greater or equal diameter is acceptable.</li> </ul>
2.	Schedules contractor to conduct GPR surveys in the proposed area for concrete penetrations utilizing penetrating radar, ultrasonic, or similar technology and has the underground utilities marked.

*Continued on next page*



## Determining GPR Survey Requirements, Continued

### How to Meet GPR Survey Requirements (continued)

This subsection provides the instructions needed to satisfy applicable GPR requirements and responsibilities of the Excavation Permit Requester to determine if Excavation is exempt from GPR, GPR survey procedures. (Steps 3-4)

Steps	Action
<b>GPR Requirement Steps</b>	
3.	Marks ground as appropriate per section " <a href="#">Utility Marking Requirements</a> " for utilities found during survey and provide summary of information in Excavation mailbox.
4.	Communicate information found during GPR survey to PC and/or Excavation Supervisor.

**Important:** GPR is highly recommended on Excavation jobs that will involve Excavating other substrates (i.e. asphalt, dirt) but not required if other sources of information like markings, NNS personnel system knowledge, updated drawings, Excavation maps, and site sketch provide adequate information regarding location and depth of underground utilities.



## Utility Markings Requirements

---

**In This Section** This section provides instructions for meeting the criteria and satisfying applicable Utility Marking Requirements and includes the following subsections:

- How to Meet the Utility Marking Requirements
- Maintaining Utility Markings
- NNS Markings – Colors
- Material Type Abbreviations

### **How to Meet the Utility Marking Requirements**

Prior to disturbing any ground, roadways, railways or intrusive concrete penetration, all known underground utilities shall be marked and the boundaries of the excavation area(s) marked with a solid white paint line, initialed and dated.

Markings shall be adequate for its intended purpose and not be excessive or oversized.

The marker types that are the most suitable to the terrain and site conditions shall be used. If the state of the ground is not conducive to paint markings, other means of identification shall be used. Examples may include:

- Stakes
- Marking Whiskers
- Other means approved by VA811 Standards

### **Maintaining Utility Markings**

The Excavation Permit Requester and/or Contractor Coordinator shall ensure utility markings remain legible throughout the excavation process and must be reapplied and maintained in the event markings are removed (i.e. asphalt removal).

In areas where marks may be destroyed (high traffic areas, gravel areas, dirt areas, asphalt removal, etc.), or where surface conditions are such that the placement of marks directly over the utility line is not possible, Offset Markings shall be used. Offset Marks shall include an arrow, pointing in the direction of the utility line, with the distance in feet and inches (measured with an appropriate instrument) to the location of the utility line shown on the right side of the arrow, with the size, material type and other information on the left side of the arrow.











---



## Utility Markings Requirements, Continued

### NNS Markings

#### - Colors

-  **RED** - Electric power lines, electric cables, electric conduit and lighting cables.
-  **ORANGE** - Communication, alarm or signal lines, communications cables, or communication conduit.
-  **YELLOW** - Gas, oil, steam, petroleum, or other gaseous or flammable material (compressed air, welding gasses, etc.)
-  **GREEN** - Sanitary sewers, storm sewer, and drain lines.
-  **BLUE** - Potable water, river water, demineralized water, steam condensate, etc.
-  **\*WHITE (Solid Line)** - Proposed excavation boundaries.
-  **\*WHITE (Line-Dot-Line)** - Underground items suspected of being utilities (typically detected by Utility Locating Companies) but whose identity and status is unknown
-  **PURPLE** - Reclaimed water, irrigation, and slurry lines
-  **PINK** - Temporary survey markings
-  **HII-NNS approved paint, not part of Virginia Standards**



## Utility Markings Requirements, Continued

---

<b>Material Type Abbreviations</b>	AC.....	Asbestos Concrete	PVC.....	Polyvinyl Chloride
	CI.....	Cast Iron	RFC.....	Reinforced Concrete
	CPR.....	Copper	SCC.....	Steel Cylinder Concrete
	DI.....	Ductile Iron	STL.....	Steel
	FO.....	Fiber Optic	TC.....	Terra Cotta
	FM.....	Forced Main	TR.....	Transite
	PL.....	Plastic	W/STL.....	Wrapped Steel

---



## Soil Storage Requirements

---

### **In This Section**

This section describes the requirements Contractors shall follow for properly storing excavation soil that is stored at an excavation site on NNS property.

---

### **Contractors Soil Storage Requirements**

The Contractor shall store the soil stockpile in the designated staging area and use the containment method selected by the Contractor Coordinator or Project Coordinator.

The Contractor shall ensure the area is protected as follows:

- Placing a plastic or polyurethane tarp under the stockpile if the storage area is on a permeable site, such as dirt or gravel.
  - Ensures a plastic or polyurethane tarp is secured over the stockpile and maintained daily.
  - Ensure any signage posted by the Contractor Coordinator or Project Coordinator remains in place.
-



## Emergency Protocol

### In This Section

This section describes the Emergency Protocol personnel must follow when unknown utility lines are either discovered or damaged during excavation work and contains the following subsections:

- Discovering Unmarked Utility Lines
- Discovering Damaged or Possibly Damaged Utility Lines

### Discovering Unmarked Utility Lines

This subsection describes the four (4) stages that personnel must follow when unmarked utility lines or obstructions are discovered during the Excavation (Digging) process.

Stage	Who is Responsible	What Happens
<b>Utility Line Discovered Stage</b>		
1.	Excavation Supervisor	<ul style="list-style-type: none"> <li>• Stops all Excavation (Digging) at the site, and</li> <li>• Informs the CC an obstruction or utility line has been discovered that is <b><u>not</u></b> on the excavations maps, site sketch, or markings.</li> </ul>
<b>Document Utility Line Stage</b>		
2.	Excavation Supervisor	<ul style="list-style-type: none"> <li>• Ensures the excavation site remains open until all utilities data are collected.</li> </ul>
3.	Contractor Coordinator / GIMMS Team	Collects as much data as possible concerning the utility line such as: <ul style="list-style-type: none"> <li>• The System</li> <li>• Current status (active or abandoned).</li> <li>• Size and type of material.</li> <li>• Location relative to known utility lines.</li> <li>• Type of coating.</li> </ul> Provides updated utilities data to GIMMS team
<b>Data Collection Completed Stage</b>		
4.	Contractor Coordinator	<ul style="list-style-type: none"> <li>• Releases the excavation site to the Excavation Supervisor allowing excavation work to continue.</li> </ul>

*Continued on next page*



## Emergency Protocol, Continued

**Emergency Protocol** This section describes the ten (10) stages that Emergency Protocol personnel must follow when either damage or possible damage to a utility line occurs during Excavation work.

**Discovering Damaged or Possibly Damaged Utility Lines**

Stage	Who Is Responsible	What Happens
<b>Document Utility Line Stage</b>		
1.	Spotter	Stops the operator from digging.
2.	Excavation Supervisor	<ul style="list-style-type: none"> <li>• Evaluates the damage to the utility line.</li> <li>• Is the utility line severed, arching or leaking?</li> <li>• If <b>YES</b>, then Excavation Supervisor will follow, subsection “Utility Line is Damaged” Stage 3.</li> <li>• If <b>NO</b>, then Excavation Supervisor will follow subsection “Utility Line Has Minor or Possible Damage” Stage 7 of this Section.</li> </ul>
<b>Utility Line is Damaged</b>		
3.	Excavation Supervisor	Takes <b>immediate</b> action to safeguard life, health and property.
4.	Excavation Supervisor	<ul style="list-style-type: none"> <li>• Calls the Communication Center <b>(757) 380-2222</b> to report the Emergency, and</li> <li>• Notifies the PC of the emergency.</li> <li>• <b>Important:</b> Dial <b>(757) 380-2222</b> to dispatch NNS Emergency personnel; <b><u>DO NOT DIAL 911</u></b> because it dispatches the City of Newport News Emergency personnel and slows down response time.</li> </ul>
5.	Communications Center	Contacts the Emergency Electricians and/or the Water Tenders to assist in evaluating the damage to utility lines.
6.	Contractor Coordinator	Contacts direct supervisor regarding the situation.

*Continued on next page*





## Emergency Protocol, Continued

**Discovering Damaged or Possibly Damaged Utility Lines,**  
*(continued)*

Stage	Who is Responsible	What Happens
<b>Utility Line Has Minor or Possible Damage</b>		
7.	Excavation Supervisor	<ul style="list-style-type: none"> <li>• Stops all digging at the site.</li> <li>• Informs the PC of the possible damage to the utility line.</li> </ul>
8.	Contractor Coordinator	Requests the support of the Emergency Electricians and/or Water Tenders to assist in evaluating the damage.
9.	Emergency Electricians / Water Tenders	<ul style="list-style-type: none"> <li>• Inspects the utility line.</li> <li>• Informs the PC the extent of the damage (if any) and any recommendations.</li> </ul>
10.	Contractor Coordinator	<ul style="list-style-type: none"> <li>• Decides if the damage is minor and the digging can continue, or</li> <li>• Informs the Excavation Supervisor repairs will be needed and when to continue the Excavation.</li> </ul>