

Ohio Utilities Protection Service

Call 811

before you dig

**EXCAVATOR
MANUAL**

www.oups.org

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PREFACE

This booklet provides basic information on safe excavation practices in Ohio. It is intended as an *educational* resource only, so please be advised of the following:

- ☀ This booklet is not a legal reference. You should consult your attorney, if necessary, for advice on interpreting the law.
- ☀ It does not contain the complete text of the Ohio Revised Code (ORC) 153.64, 3781.25-3781.32. Also, it does not contain reference to OSHA Standard 29 CFR 1926.651. Log onto the Ohio Utilities Protection Service, O.U.P.S., website for the full-text version of these laws: www.oups.org.
- ☀ The information in this booklet is subject to change without notice.

Throughout this manual, you will see



Please pay special attention to these tips to help in the process of a safe excavation.



O.U.P.S. itself does not locate or mark underground facilities. Locating and marking facilities is the responsibility of the utility owners.

There may be other company regulations or policies for you to follow, so you should also double-check with your supervisor.



WHAT IS AN EXCAVATION?

ORC 3781.25(I) | "Excavation means the use of hand tools, powered equipment, or explosives to move earth, rock, or other materials in order to penetrate or bore or drill into the earth, or to demolish any structure whether or not it is intended that the demolition will disturb the earth..."

Excavations include, but are not limited to:

- Demolition of buildings or other structures, even if you do not expect to disturb the earth during demolition.
- Coal mining and reclamation operations regulated under Chapter 1513 of the Revised Code and rules adopted under it.
- Government work in excess of 12 inches deep. Farming activity such as installation of drain tiles and tilling to a depth of more than 12 inches.

Other types of excavation but not limited to:

- Grading
- Digging
- Dredging
- Auguring
- Scraping
- Wrecking
- Blasting
- Setting poles/pipes
- Installing sign poles
- Trenching
- Ditching
- Drilling
- Tunneling
- Potholing
- Tree stump removal
- Razing
- Cable or pipe plowing or driving
- Driving survey pins
- Boring holes for percolation tests

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WHAT IS AN EXCAVATION? (Continued)



ORC 3781.30 | Trenchless Technologies

When utilizing trenchless excavation methods, the excavator must comply with the following requirements:

- 1) Expose and confirm all underground utility facilities at each crossing point by the proposed excavation in a nondestructive manner to the installation depth of the new facility.
- 2) Expose all parallel underground utility facilities in a nondestructive manner at the beginning and end of each trenchless excavation to the installation depth of the new facility. If the proposed alignment is within the tolerance zone of any parallel underground utility facility, the underground utility facility shall be exposed every one hundred feet.
- 3) Ensure that the final product installation maintains the proper clearances of existing underground utility facilities.

Always refer to your HDD Guidelines Book for suggestions when digging within the tolerance zone of the underground facility with this equipment.

.....
Liquid pipeline companies may have additional guidelines for excavating near their facilities.



UTILITY EMERGENCY REPAIRS

An emergency situation can be defined as a “sudden or unexpected occurrence involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to life, health, property, or essential public services.”

ORC3781.28(F)(1) | “...In the case of a utility that is making an emergency repair to its own underground utility system or a governmental entity making an underground emergency repair to traffic control devices, as defined in section 4511.01 of the Revised Code, used on any street or highway under the entity’s jurisdiction, the utility or governmental entity shall notify the protection service and each limited basis participant of the excavation site. This notice need not occur before commencing excavation...”



Only actual emergencies should be designated as such when a dig notification is provided to O.U.P.S. An example of an emergency is a broken water main.

EXCAVATOR TRAINING

All Excavators utilizing a protection service are required to obtain training in the protection of underground utility facilities. An excavator shall be deemed to have obtained that training if the excavator is a member of a protection service or a statewide association representing excavators and the service or association provides that training. An excavator also may obtain the training from such a service or association without becoming a member.

WHY DO I NEED TO CALL BEFORE I DIG?

It all begins with planning your work. A careful review of your plans and your work area prior to the actual excavation can help save you and your company from unexpected downtime, loss of revenue, and injury.

A safe excavation can be achieved by following the suggestions and processes outlined in this manual.

Follow these four steps to safe digging:

- 1.** Call before you dig
 - 2.** Wait the required time for marking
 - 3.** Respect the marks
 - 4.** Dig with care
-

WHY O.U.P.S.?

Ohio Utilities Protection Service (O.U.P.S.)

ORC 3781.25(A) | O.U.P.S. is a private, nonprofit, statewide organization established by law. It has the responsibility to manage the “call before you dig” process for Ohio.

O.U.P.S. is a communications link between the excavator and the utility owner/operators.

O.U.P.S. DOES NOT MARK LINES.

The O.U.P.S. mission is to serve the customers’ needs by providing a quality one-call process to:

- Protect the public
- Protect the underground infrastructure
- Protect the environment

O.U.P.S. is only a call away:

- The O.U.P.S. center operates 24 hours a day, 7 days a week answering calls from anyone who plans to dig in the state of Ohio.



THE PROCESS OF SAFE DIGGING

The first step to a safe excavation begins during the planning stages. By planning your work, understanding your work area, and deciding when you plan to start your excavation project, you are on your way to digging safely.

Plan before you make the call:

- Assess your route or excavation site
- Gather all your information needed to complete the Locate Work Order Form
- Premark the location in white paint, flags, or both

Now the person digging can make the call



ORC 3781.28(A) | “...at least “48” hours but not more than ten days before commencing excavation, the excavator shall notify the protection service of the location of the excavation site and the date on which the excavation is planned to commence...”

WHAT HAPPENS DURING THE CALL?

When you call O.U.P.S. you will be asked questions regarding your project. You will need to have the O.U.P.S. Locate Work Order information ready. See the next page for a list of the information that will be requested.

O.U.P.S. LOCATE WORK ORDER

CONTACT PHONE NUMBER

CALLER'S NAME

COMPANY NAME

FAX NUMBER

EMAIL

COUNTY

CITY/TOWNSHIP

ADDRESS/LOCATION OF WORK

EXTENT OF WORK: FRONT/SIDES/REAR

FARTHEST DISTANCE/DIRECTION BACK OFF ROAD

LOT#

SUBDIVISION

BUILDER NAME

CROSS/BETWEEN STREETS

DISTANCE AND DIRECTION FROM CROSS STREET

DATE OF EXCAVATION

START TIME OF EXCAVATION

TYPE OF WORK

WORKING FOR COMPANY

WORK DONE BY COMPANY

MEANS OF EXCAVATION

BLASTING

PRE MARKINGS

MEET

RR RIGHT OF WAY

HIGHWAY

MILE MARKER AT/FROM

COMMENTS

O.U.P.S. TICKET NUMBER



WHAT HAPPENS AFTER I MAKE THE CALL?

After you have given all the appropriate information to the Customer Service Representative (CSR), this is what happens:

- The CSR will read all information back to you.
- You must listen carefully and verify its accuracy.
- You will be given a list of member utility owners that O.U.P.S. notifies.
- **ORC 3781.26(C)** | You will be given a reference/ticket number that is proof of your call. Record the number and keep it for the duration of your excavation or longer when applicable. This number also allows access to positive response.



ORC 3781.271 | Beginning July 1, 2013, each protection service shall reasonably modify its one-call notification system so as to permit the reasonable identification of the location of a proposed excavation site in a manner in which the protection service may then notify any potentially affected limited basis participants. Each member of a protection service, including limited basis participants, shall be responsible for providing current contact information to the protection service.

.....
A point of caution: not all utilities are members with O.U.P.S.

SO I'VE CALLED, NOW WHAT DO I DO?

WAIT THE REQUIRED AMOUNT OF TIME:

ORC 3781.28(A) | "...at least "48" hours but not more than ten working days before commencing excavation, the excavator shall notify a protection service of the location of the excavation site and the date on which the excavation is planned to commence..."

UNDERGROUND FACILITIES WILL BE MARKED BY THE FACILITY OWNERS

ORC 3781.29(A) | Within 48 hours of your call to O.U.P.S., each utility shall review the status of its facilities within the excavation site, locate and mark its underground utility facilities at the excavation site.

ORC 3781.26(D) | Each utility fully participating in a protection service pursuant to this section shall also participate in its affiliated positive response system. Each utility participating in a protection service on a limited basis shall directly communicate to the excavator the presence or absence of any conflict between the existing underground utility facilities and the proposed excavation site.

ORC 3781.29(C) | "A utility shall mark its underground facilities using the following color codes:..."



The 48 hour notice for utilities to mark excludes Saturdays, Sundays, and Legal Holidays.



OHIO'S UNIVERSAL MARKING STANDARDS

APWA COLORS

The American Public Works Association recommended color code shall be used to mark the location of underground facilities, temporary survey markings, and site of intended excavation. When utility company representatives mark a location, they use colored flags and/or paint to identify the type of underground service:

RED	Electric Power Lines, Cables, Conduit and Lighting Cables
YELLOW	Gas, Oil, Steam, Petroleum, or Gaseous Materials
ORANGE	Communication, Alarm or Signal Lines, Cables or Conduit
BLUE	Potable Water
PURPLE	Reclaimed Water, Irrigation and Slurry Lines
GREEN	Sewers and Drain Lines
PINK	Temporary Survey Markings
WHITE	Proposed Excavating



WHITE LINING

While it is necessary to be specific about your area of excavation when contacting the Ohio Utilities Protection Service, excavators are required to pre-mark with white paint in order to show the facility owners/locators the specific area where excavation will take place. This will eliminate locating underground facilities that are not involved in the excavation area and reduce unnecessary paint on our streets, roads, and sidewalks.

3781.29(F)(1-4) | An excavator is not required to premark the approximate location of an excavation as provided in division (D) of this section in any of the following situations:

- (1) The utility can determine the precise location, direction, size, and length of the proposed excavation site by referring to the notification provided by the protection service pursuant to sections 3781.27 and 3781.28 of the Revised Code.
- (2) The excavator and the affected utility have had an on-site, preconstruction meeting for the purpose of premarking the excavation site.
- (3) The excavation involves replacing a pole that is within five feet of the location of an existing pole.
- (4) Premarking by the excavator would clearly interfere with pedestrian or vehicular traffic control.

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WHITE LINING *(Continued)*

For a single point excavation, such as installing poles, pedestals, or planting a tree, mark (with white paint) the area by using dashes to show the owners/locators the area of excavation.



For continuous excavation, such as trenching, boring, etc., mark the center line of excavation with dashes in white paint. Excavation width (in feet) shall be indicated on either side of the center line in legible figures.

White flags or stakes may be used in place of white paint and, in some situations, may be more practical.

EXCESSIVE MARKS

Markers used to identify underground facilities should not be excessive or oversized.



MARKERS APPROPRIATE FOR AREA

Underground facilities shall be marked using paint, flags, whiskers, chalk or other media as appropriate or a combination to identify the facility(s). Marks shall be placed at the beginning and end of the locate and at a minimum interval of two feet but not more than fifty feet throughout the locate as needed to clearly identify the route of the underground utility.

It is recommended that when flags are used at the excavation site by the facility owner/locator, the facility owner/operator's name is on the flag as well as a contact name and phone number. This contact will be able to assist the excavator if additional information is needed about the location of underground facilities.

IDENTIFICATION ABBREVIATIONS

When marks are placed at the excavation site, the owner/operator of a utility line shall be indicated by a letter or letters utilizing the APWA color code. These letters shall be legible and placed at the beginning and end of the locate and at intervals throughout the locate as needed to clearly identify the owner/operator. This may also be achieved by the use of flags that indicate the owner/operator of the facility.

Visit **www.oups.org/markings**
to view the facility owner identification codes list.



CABLES

Underground utility lines of the same type in the same trench owned by the same company shall be marked individually.

- A.** If a single underground facility is present, it shall be marked by placing a single mark over the approximate center of the facility. It is recommended that this mark be a minimum of 1" wide and 12" in length.



- B.** If multiple underground facilities are present, they shall be marked by placing a single mark over the approximate center of each underground facility. It is recommended that this mark be a minimum of 1" wide and 12" in length.



Marks shall be placed at the beginning and the end of the locate and at a minimum interval of two feet but not more than fifty feet throughout the locate as needed to clearly identify the route of the underground utility.

PIPELINES

A. Pipelines 2 inches and smaller (nominal size): The physical location of a pipeline shall be represented by a single mark.



B. Pipelines larger than 2 inches (nominal size): The physical location of a pipeline shall be represented by a single mark. The nominal size shall be noted.



For all pipelines:

1. The owner/operator shall be identified. Flags, as well as paint, shall be deemed acceptable as identifying the owner/operator.
2. When known, the material type of the pipeline shall be indicated using the "material type" abbreviation index.
3. When the facility is installed in casing the facility shall be marked as follows: "diameter and material type / casing diameter and material type". If the casing size or material is unknown it shall be indicated by "UNKN" and, the excavator, designer, or engineer should contact the facility owner. All parties involved shall work jointly to establish accurate information.

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PIPELINES *(Continued)*

4" STL CG/12"DI 4" STL CG/UNKN

4. Marks shall be placed at the beginning and the end of the locate and at a minimum interval of two feet but not more than fifty feet (50') throughout the locate as needed to clearly identify the owner/operator, pipeline location, material, and width.
5. All numbers identifying width shall be in inches.

CONDUIT/DUCT BANK

The term "conduit" shall be used for a single enclosure containing one or more facilities; the term "duct bank" shall be used for a structure containing two or more conduits.

- A. For banks constructed with ducts sized 2 inches or less, the following information will be provided:
 1. A single mark is used.
 2. A diamond is placed within the mark.
 3. The number of small-diameter ducts shall be indicated within the diamond symbol.

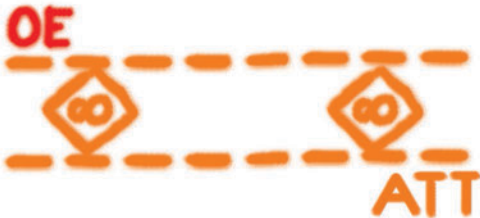


CONDUIT/DUCT BANK *(Continued)*

- B.** For duct banks containing ducts larger than 2 inches, the following information will be provided:
1. The duct bank boundary (the “width”) is identified with marks after locating the outermost ducts within the bank.
 2. The number of facilities shall be placed within the diamond. This diamond shall be placed within the duct bank boundary marks.



In situations where multiple conduits/ducts which are owned and/or operated by different companies are placed together in a bundle fashion, a conduit structure or duct bank marking symbol shall be used by the first operator marking the facility. Other operators owning facilities within the bundle shall verify the marks and add their owner/operator letter designation.



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CONDUIT/DUCT BANK *(Continued)*

C. For all conduits and duct banks:

1. The owner(s)/operator(s) shall be indicated using the facility owner identification code.
 2. Marks shall be placed at the beginning and the end of the locate and at a minimum interval of two feet but not more than fifty feet (50') throughout the locate as needed to clearly identify the owner/operator, the conduit/duct bank location, and the number of conduits.
-

TERMINATION POINTS

Termination points, stub outs, and dead ends shall be marked as shown. Marking could also be accompanied by adding the letters "TP".



CHANGE IN DIRECTION

When deviations in the direction of a facility are known to exist, the deviations shall be marked in a manner which clearly identifies the route of the facility.



OFFSET MARKS

In areas prone to the frequent destruction of marks, offset marks may be used in conjunction with the marks placed at the actual location of a facility. They are intended to be used as a supplemental means of marking.

1. A line is placed in conjunction with an arrow and a measurement (stated in feet), which specifies the distance from the reference line to the actual location of the facility.
2. The arrow indicates the direction from the reference line to the actual location of the facility.
3. The arrow shall be oriented at 90 degrees to the reference line.
4. The distance to the actual location of the facility, from the reference line, shall be placed on one side of the arrow.
5. The locator shall provide all of the necessary information which adequately identifies the specific facility in accordance with the marking standards. This information shall be placed on the side of the arrow which is not utilized for the "distance" information.



VALVE PITS/MANHOLES/VAULTS

When known, the perimeter of valve boxes, manholes, and other surface indicators shall be marked using the appropriate APWA color code. The structure should be named as such (vault, pit, manhole...) along with the structure owner's indicator. If the structure size is unknown it shall be indicated as "UNKN". If the size of the structure is not indicated, the excavator, designer, or engineer should contact the facility owner. All parties shall work jointly to establish accurate information.



FACILITIES UNDER BODIES OF WATER

Identifying Facilities Located Under Bodies of Commercially Navigable Waterways...

It is recommended that facility owner/operator shall comply with applicable state and federal standards.

CORRECTING MARKING ERRORS

Marking errors shall be corrected by the locator/operator and communicated to the excavator as soon as possible after the discovery of such errors. Appropriate methods shall be used to remove or cover up the erroneous markings (Example: black paint may be used to cover up erroneous markings on paved areas). In the event of damage, marking errors shall be preserved until such marks are documented.

FOR ADDITIONAL INFORMATION ON LOCATING PRACTICES...

This manual outlines the recommended facility marking standards for Ohio. For additional information on locating practices, including the use of facility records, locator training recommendations, and safety guidelines, refer to Common Ground Alliance Best Practices at **www.commongroundalliance.com**.



DEFINITIONS

Conduit – A single enclosure containing one or more facilities.

Duct Bank – A structure containing 2 or more conduits.

Owner – Any person or entity who owns the means to convey services or materials.

Operator – Any person who furnishes or transports materials or services by means of a utility line.

Pipelines – Underground utility lines used for the transportation of hazardous liquid, steam, water, sewer, storm, and gaseous materials.

Visit **www.oups.org/markings**
to view the definitions list.

MATERIAL TYPE ABBREVIATIONS

AC Asbestos Cement

CI Cast Iron

CPR Copper

C/ST ... Coated Steel

DI Ductile Iron

FO Fiber Optic

FM Forced Main

PI Plastic Line Inserted
into Steel

PL Plastic

PVC Polyvinyl Chloride

RFC Reinforced Concrete

SCC Steel Cylinder Concrete

STL Steel

TC Terra Cotta

TR Transite

Visit **www.oups.org/markings**
to view the material type abbreviations list.

I SEE THE MARKS... NOW I CAN DIG WITH CARE

YOU have *planned*, YOU have made the *necessary calls*,
YOU are now *ready to dig*... **Now what do you do?**

ORC 3781.30 | Duties of Excavator...

When making excavations using traditional or trenchless technologies, the excavator shall do all of the following:

- (1) | Maintain reasonable clearance between any underground facility and the cutting edge or point of powered equipment;
- (2) | Protect and preserve the markings of tolerance zones of underground utility facilities until those markings are no longer required for proper and safe excavations;
- (3) | When approaching and excavating within the tolerance zone of underground utility facilities with powered equipment, require an individual other than the equipment operator to visually monitor the excavation activity for any indication of the underground utility facility;
- (4) | Conduct the excavation within the tolerance zone of underground utility facilities in a careful, prudent and nondestructive manner, when necessary, in order to prevent damage.
- (5) | Excavate up to the total depth of the excavation to either determine the precise location of underground utility facilities or verify that the total depth of excavation is free of such facilities.

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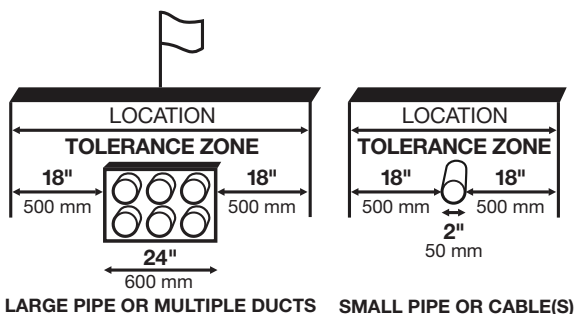
I SEE THE MARKS... NOW I CAN DIG WITH CARE

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3781.31(B) | If the markings of underground utility facilities made under section 3781.29 of the Revised Code are destroyed or removed before excavation is completed, the excavator shall notify the utility through the protection service that the markings have been destroyed or removed, and the utility shall remark the facilities in accordance with section 3781.29 of the Revised Code." **Wait 48 hours for remarks at the excavation site.**

Remember:

3781.25 (E) "Tolerance Zone" means the site of the underground utility facility including the width of the underground utility facility plus eighteen inches on each side of the facility.



Methods of excavation within this area include, but are not limited to:

- 🔦 Hand digging
- 🔦 Pot holing
- 🔦 Vacuum excavation



WHAT TO DO IF A DAMAGE OCCURS

For your safety you should walk away immediately and take steps to clear the area to protect yourself and your crew. Do not try to repair or stop a leak yourself or use anything that might create a spark, such as a cell phone.

According to the Federal Pipeline Inspection, Protection and Safety Act—a person who engages in demolition, excavation tunneling, or construction, and who causes damage to a pipeline facility that may endanger life or cause serious bodily harm or damage to property—

(A) may not fail to promptly report the damage to the owner or operator of the facility; and

(B) if the damage results in the escape of any flammable, toxic or corrosive gas or liquid, may not fail to promptly report to other appropriate authorities by calling the 911 emergency telephone number.

Also call O.U.P.S. so that other utility owners in the area may be notified.

ORC 3781.30(7) | "...take reasonable appropriate actions needed to protect persons or property and to minimize safety hazards until those agencies and departments and the utility arrive at the scene..."

ORC 3781.30(6) | "...As soon as any damage is discovered, including gouges, dents, or breaks to coating, cable sheathes, and cathodic protection anodes or wiring, report the type and location of the damage to the utility and permit the utility a reasonable amount of time to make necessary repairs;"

A LIST OF "DO'S" DURING EXCAVATION

- **Do** keep a reasonable clearance between any underground facility and the cutting edge or point of powered equipment.
- **Do** protect and preserve the color-coded markings until those markings are no longer needed for proper and safe excavation.
- **Do** call for a remark if the markings are destroyed or removed before excavation is complete and allow 48 hours to remark the site.
- **Do** be sure someone other than the equipment operator, i.e. the spotter, is there to look for any sign of the underground facility.
- **Do** conduct the excavation near the underground facility carefully. Excavate in a careful and prudent manner, by hand, if necessary, to be able to tell the exact location of the underground facility and to prevent damage.
- **Do** protect and support exposed facilities during excavation and then take care while backfilling to maintain support to prevent damage. Be sure that backfill materials are free of any material that could damage the facility.
- **If** an excavation will cover a large area and will progress from one area to the next over a period of time, the excavator shall provide written notice of excavation with projected timelines for segments of the excavation as the excavation progresses in order to coordinate the marking of facility locations with actual excavation schedules.



Be prepared. Always have an updated list of emergency contact numbers for the excavation area including law enforcement, fire, and utilities. Facility markers in the area display emergency contact information.



A LIST OF "DON'TS" DURING EXCAVATION

- ❗ **Don't** assume that a pipeline or cable runs straight between facility markers.
- ❗ **Don't** assume the depth of a utility. Never assume that an underground facility is the same depth throughout the entire route of the excavation.
- ❗ **Don't** excavate within the tolerance zone with any other equipment except what has been recommended in this guide.
- ❗ **Don't** report emergency locates that are not emergencies.
- ❗ **Don't** refresh the utility locators marks with your own paint. Call O.U.P.S. to request a remark.
- ❗ **Don't** work on someone else's ticket number.
- ❗ **Don't** assume *all* facility owners have responded to your request. Check positive responses.



OSHA mandates change regularly; please make sure that you are up to date.

8-1-1 or **1-800-362-2764** www.oups.org

THINGS TO REMEMBER

O.U.P.S. operates 24 hours a day, 7 days a week, 365 days a year, answering calls from anyone who intends to dig in the state of Ohio.



1-800-362-2764
www.oups.org

4740 Belmont Avenue
Youngstown, Ohio 44505





COLOR CODES FOR LOCATING UTILITY LINES

RED

Electric Power Lines, Cables, Conduit and Lighting Cables

YELLOW

Gas, Oil, Steam, Petroleum, or Gaseous Materials

ORANGE

Communication, Alarm or Signal Lines, Cables or Conduit

BLUE

Potable Water

PURPLE

Reclaimed Water, Irrigation and Slurry Lines

GREEN

Sewers and Drain Lines

PINK

Temporary Survey Markings

WHITE

Proposed Excavating

Tolerance Zone: *Width of Underground Facility Plus 18" on Each Side.*

