

Common Problems and Claim Threats Checklist

Below is a checklist covering some common problems and claim threats that can occur during trench excavation.

Note that some specifications described in the following content may not be the same as the specifications followed by your agency. Always check with your State agency's standards and specifications when using these guidelines.

Sections

- **Changed Conditions**
- **Difficult Excavation**
- **Trench Bottom Deterioration**
- **Trench Access**
- **Dewatering and Seepage Control**
- **Others**

Changed Conditions

- Due to the variability of soils and the limited number of borings taken to identify the subsurface conditions, there can be problems during construction resulting in contractor claims for additional compensation**
- One of the most common problems during construction is changed soil conditions where the material encountered does not correlate with the soil borings on the project plans**
- In some cases, the design may have to be altered such that a deep foundation may be necessary instead of the original design of a spread foundation**

Difficult Excavations

- Some problems that cause difficult excavation are caving soils and ground water
- Deep excavations requiring trench boxes or sheet piling, which may require bracing can be challenging
- This work requires the use of experienced contractors utilizing the proper equipment to conduct the work to minimize problems during the excavation

Trench Bottom Deterioration

- After the excavation is complete, sometimes the soil at the trench bottom has deteriorated, been overly disturbed, or is otherwise unsuitable for foundation material
 - In these cases, the unsuitable material must be undercut and replaced with competent material
- One of the most common trench undercut backfill materials is a coarse crushed aggregate (100% passing the 1.5-inch sieve), which will interlock and provide a suitable bearing surface
- In some instances, depending on the soils, the trench may need to be underlain with a geotextile separator to minimize the potential for the intermixing of the soil
- The trench bottom can deteriorate when left open too long, especially with soils containing significant amounts of fine-grain soils
- One cause is the simple fact that the soil at the bottom and sidewalls of the excavation want to expand (rebound) when the weight of the soil above is removed after excavation

- Over an extended period of time, the soil within the trench will loosen or soften
- This is particularly problematic with non-plastic silts, which loosen (fluff) within hours
- Rainwater entering footing trenches before concrete can be placed will also soften the trench bottom
- For these reasons, it is generally good practice for footing trenches to be excavated and inspected, and the reinforced concrete placed within 24 hours
- Should rain water enter the footing trench before concrete is placed, the reinforcing steel must be removed, the trench bottom re-inspected, and soft soils removed and replaced before reinforcing steel can be repositioned and the concrete poured, resulting in delays

Trench Access

- Access to excavated trenches for inspectors and contractor's workers is typically necessary on most projects
- To ensure the safety of those entering the excavation site, it is critical that all OSHA requirements and any local ordinances be strictly adhered to
- The contractor should provide all necessary means to access the trench such as ladders, ramps, benching, trench boxes, or other measures

Dewatering and Seepage Control

- If groundwater is encountered above the elevation of the required excavation, it may be necessary to dewater the site to complete the work

**Earthwork Series –
Trench Excavations
AT-TC3CN024-18-T1-JA03**

- One method of dewatering is to install well points in the vicinity of the work to lower the water table to enable the excavation to be conducted in a relatively dry condition
- Another method of dewatering is to construct a sump pit outside the limits of the foundation or trench and pump the water down to the necessary elevation
- In either case, the discharge of the pumped water must be directed to an acceptable location
- Depending on the conditions in the bottom of the trench, quite often a sub footing is specified to maintain a relatively dry trench
- The sub footing is typically 3 to 6 inches thick and is made from grade X concrete

Others

- Other problems encountered that could result in claims are unanticipated obstructions, live or abandoned utilities, and sites of environmental contamination
- These issues can be challenging and quite often result in cost overruns, extra quantities, and disposal costs