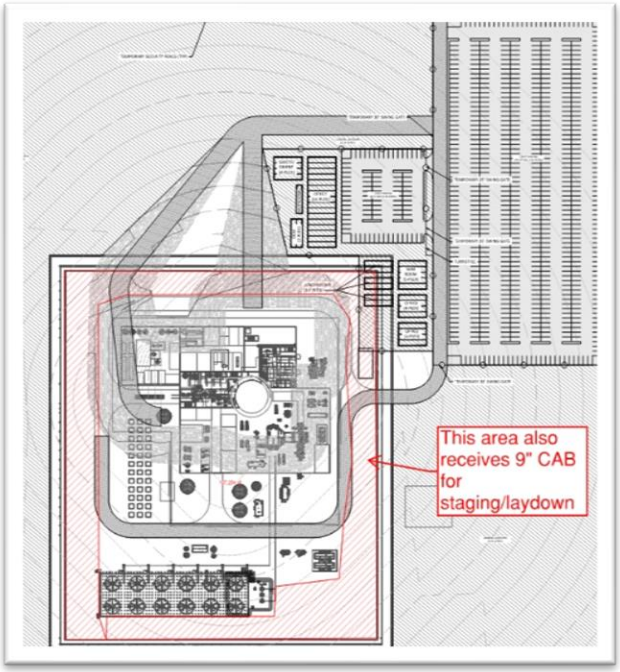
Holtec SMR Hypothetical LWA – Possible Activities

This enclosure contains figures to improve understanding of the potential activities. Note that these images reflect a single-unit site and do not reflect the recent Holtec SMR uprate. They should not be considered definite descriptions of the site layout or component designs but are representative of the general approach that SMR may pursue in an LWA.

Site Preparation Activities (Not "Construction")

Clearing and Grubbing - Holtec will begin by clearing and grubbing the site. Clearing refers to the removal of all vegetation, while grubbing is the removal of roots that remain in the soil. This includes the removal of all logs, brush, and debris, as well as grinding and removal of stumps.



Laydown Development – Holtec will develop project laydown areas using crushed aggregate base (CAB) placed and compacted over geogrid.

Parking and Temporary Facilities – Holtec will develop and install parking for construction staff and craft. The parking will have a crushed aggregate base and be paved.

Fab Slab Development – Holtec will install temporary concrete slab(s) 6-12" thick, reinforced with Helix micro rebar, which will be used for onsite fabrication of pipe and modularized components.

Construction Trailers and Facilities – Holtec will install temporary construction offices and will make any water, sewer, and electrical connections required to service the site.

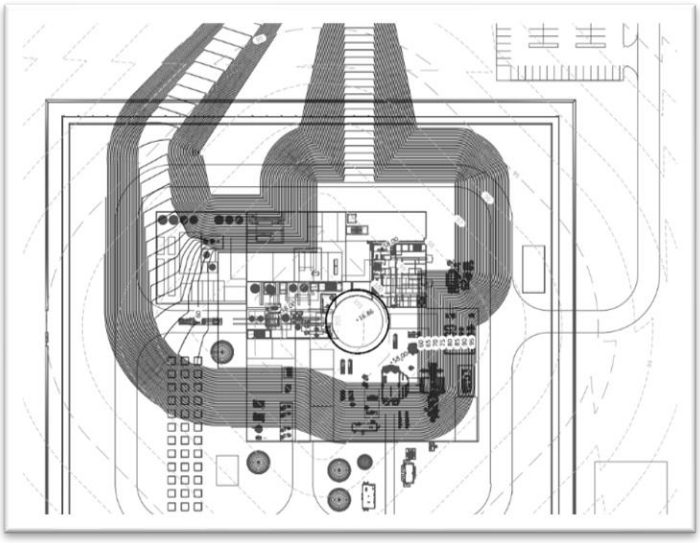
Temporary Warehouse(s) – Holtec will install temporary foundation and metal fold-out buildings which will be used to store materials during construction. These buildings are pre-engineered and will be erected on reinforced concrete foundations that will be cast in place.

Install BMPs – Construction best management practices (BMPs) will be implemented at the start of construction in accordance with the Storm Water Pollution Prevention Plan (SWPPP). This includes the installation of erosion control devices and practices which minimize the potential for erosion by protecting exposed soil from rain, wind, and construction-related processes.

Security – Security measures will include installation of turnstiles, guard shacks, and any temporary fencing required to control access into the construction site.

Mass Excavation – Overburden from existing grade down to plant grade elevation will be excavated prior to the start of structure excavation. After the main site is excavated to plant grade, the main structure excavation will occur. The first structure excavation will be for the Control Building (CB); excavation will proceed to the bottom of the Reactor Auxiliary Building (RAB). Ramps will be constructed to allow access for trucks hauling to stockpile/waste areas. Any suitable material for backfill will be stockpiled in a separate area to be used later. Any unsuitable material will be wasted in a separate area.

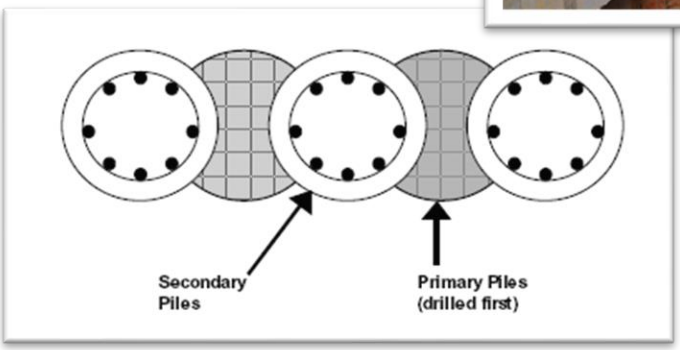
Hypothetical "Construction" Activities



Stabilizing Excavation Ramps –

As excavation progresses, geogrid and CAB will be placed on the ramps to provide a stable working surface for dedicated equipment and personnel down to the RAB bottom elevation. The CAB and geogrid will remain in place during backfill operations later in the project. The sketch at right provides an overview of the bathtub excavation and ramps.

Install Secant Pile – After the excavation has been completed down to the RAB bottom elevation, the secant pile walls will be installed to support the excavation of the containment enclosure structure (CES) foundation. Secant piles are formed by constructing intersecting reinforced concrete piles. The secant piles are reinforced with either steel rebar or with steel beams and are constructed by either drilling under mud or auguring. Primary piles are installed first with secondary (male) piles constructed in between primary (female) piles once the latter gain sufficient strength.



Excavate for Containment Enclosure Structure (CES) – After the secant piles are complete and have gained adequate strength, the remainder of the material will be removed from inside the secant pile. A long reach excavator will be used to excavate down to the depth of the bottom of the mud mat for the CES. A small dozer will be lowered into the bottom of the excavation to push material to the excavator to be removed. For excavations deeper than the CES base mat a small loader and truck bed will be lowered into the excavation by crane. The only excavation expected below the bottom elevation of the CES base mat is for the excess material removal required for placement of the secant piles. The secant piles must be placed deeper than the CES base mat for stability of the deep excavation ahead of mud-mat placement. The loader placed in the base of the excavation will fill the truck bed and the crane will fly out and dump the material. All suitable excavated material will be stockpiled on site to be used for backfill. Unsuitable material will be wasted at a separate location on site.

Place Mud Mat – The mud mat is a layer of lean concrete placed under the base mat foundation. The mud mat provides a solid and stable working surface for constructing the base mat. It also provides anchorage points for formwork. If underground water is an issue, the mud mat thickness can be increased to seal any water from entering the excavation and eliminate issues with buoyancy.

Install Base Mat – After the mud mat is in place, rebar operations and installation of anchor bolts for the CES base mat will begin. The secant pile wall will act as the outer form for concrete placement. Holtec will use a concrete pump truck for placing concrete into the base mat from the excavation for the RAB foundation.

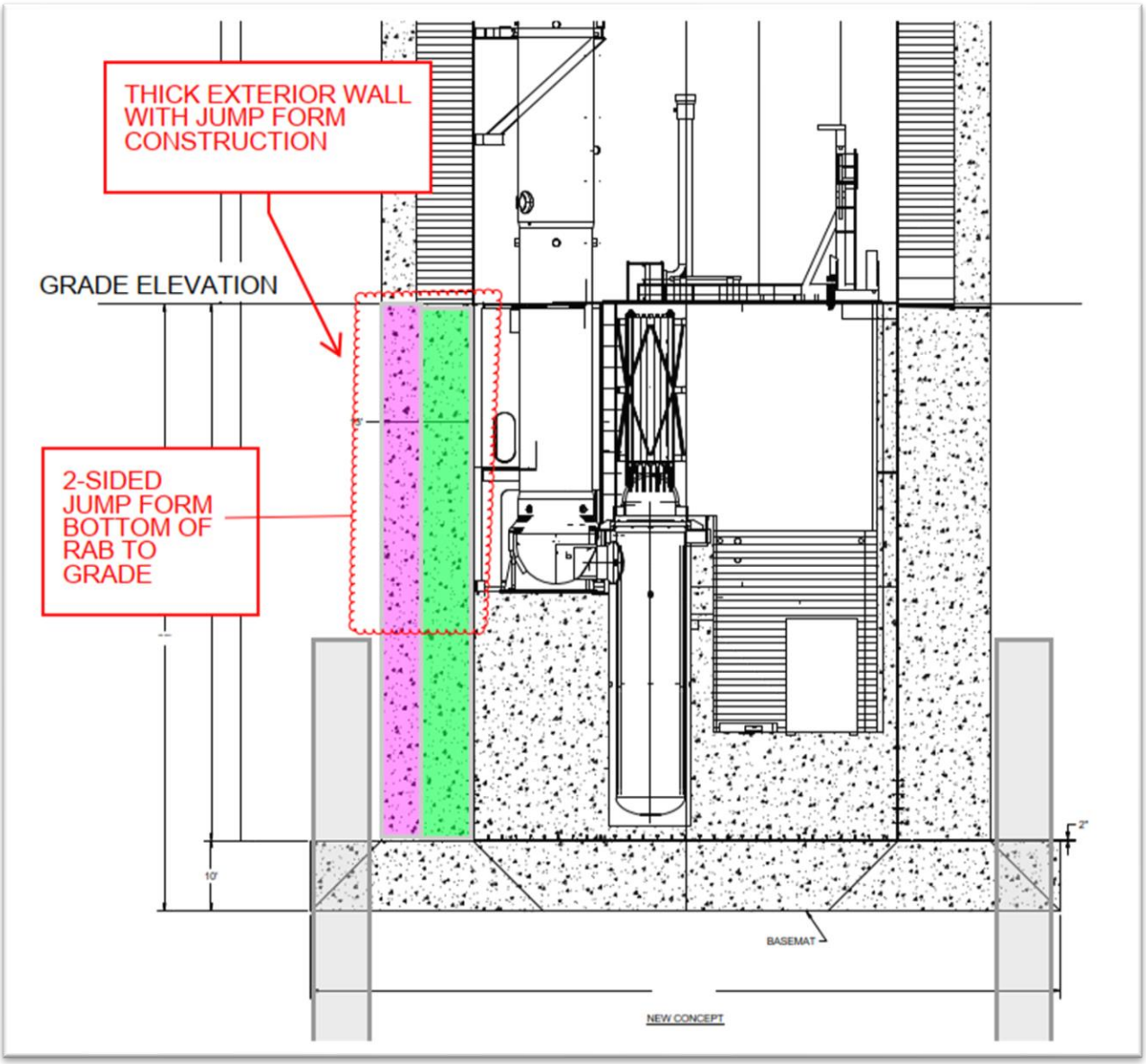
Install CES Walls – The CES walls from the base mat to the top of secant pile wall (approximately level with the RAB foundation) will be placed. The secant pile wall will act as the outer formwork and a single sided form will be used for the interior side of the wall. The forms for the CES walls will jump from level to level in 10- to 15-foot increments in height. A jump form is a type of formwork system designed to construct multiple lifts in concrete structures that have the same size and shape for multiple lifts. The one-sided jump form will be used for the first three to four lifts in the CES. A crane will lift the formwork from one level to the next.

Above the secant piling, Holtec is evaluating the use of modular construction. Details would be addressed in the LWA application. For a traditional reinforced concrete construction of the CES above the secant pilings, after reaching the top of the secant pile elevation, a traditional jump form system will be used consisting of both an inner and outer formed wall. The secant walls will remain in place as part of the permanent CES foundation. If a steel-concrete modular construction design is used, the jump form process for placing concrete would be replaced with the installation sequence of successive levels of steel modules and filling with concrete.

Under an LWA, Holtec anticipates constructing the CES walls to the level of the RAB foundation. The above-ground portions of the CES will not be included.

Additional Foundations – Once the CES walls reach the level of the RAB foundation, RAB base mat construction can begin. The RAB walls will be cast against the CES walls using a single-sided wall form.

After the RAB foundation is completed to the same elevation as the bottom of CB, the CB foundation will be installed. This will require backfilling the RAB up to the bottom of CB, as the CB foundation elevation is above the depth of the RAB foundation.



Quality Compliance

NRC quality requirements will be addressed. Holtec's quality program will address controls for training, qualification, and certification of inspection and test personnel, independent oversight (auditor/lead auditor) and personnel performing welding and other special processes.

A Project Quality Manager will be assigned and a site-specific Project Quality Plan will be developed and implemented. Construction activities will meet relevant ASME and ACI requirements. Inspection and test plans will be developed to validate acceptability of the completed structures, including access for NRC inspections as necessary. Traceability of materials, inspections, and testing will be maintained.

The approach to quality compliance for all construction activities (under an LWA or a CP) is expected to be the same, such that there will be a seamless transition from one to the other.