

HOBAS®

TECHNICAL ADVICE SHEET

03-25-2022

HOBAS BRANCH FITTINGS (All Tees – Lateral & Vertical, Wyes, Bifurcations) CONCRETE ENCASEMENT

If in doubt, seek advice from: HOBAS Pipe USA | 800-856-7473

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General:

HOBAS fittings - lateral or vertical tees, wyes, etc… are all considered "branch fittings" constructed via mitered construction from various shape pipe segments and fiberglass laminations. Since the fitting components are a "flexible" pipe system, they must be kept from distorting or deforming from all service loads including internal pressure, and/or external buried loads to meet the intended service life. For gravity flow systems, typical loads may be external soil and live loads (HS20, E-80, or sim.). For pressure systems, (pumped or static head), the encasement design must consider the highest internal pressure the system will see during its intended service life. For pressure systems, steel reinforcement and other design considerations such as unbalanced thrust forces must be reviewed by the design engineer.

The fitting consists of a HOBAS thru-pipe and a HOBAS lateral branch, connected at a saddle-cut with structural fiberglass laminations. The main pipe can be straight (no angle) or mitered to a specific angle (typically up to 90º). The structural fiberglass lamination is very strong and will typically exceed the tensile strength of the pipe. Although standard direct bury pipes (SN36, 46, or 72) can withstand up to 5% long-term uniform ring deflection, the irregularly shaped saddle connection can tolerate very little deformation. The fitting must therefore be prevented from distorting. This is typically done with a concrete encasement (may need reinforcement). Details regarding necessary reinforcement, concrete compressive strength, etc. depend on site conditions and will need to be designed by the consulting engineer or contractor's engineer on a project specific basis.completed installation

Encasement:

Traditionally, the body of the fitting is encased, with the encasement stopping before the joint on each end (see FIGURE 1). While this will effectively protect the tee or wye, it creates a dramatically different support condition for the pipes on each side of the coupling at each of the adjacent joints. The fitting thru-pipe will be held very round, supported rigidly, and the adjacent pipes will be supported elastically by the native soil and the pipe-zone surround system – crushed rock or 95 SPD compacted sand. While the FWC coupling that seals this joint is flexible and somewhat forgiving, it cannot maintain seal when connecting pipes have dramatically different shapes (i.e. circle and oval).

This phenomenon is magnified as the fitting pipe diameters increase. Experience indicates that with sizes 48" and larger (typically), it is advisable to extend the concrete encasement past all joints (1' to 3' depending on diameter – see FIGURE 2). This will help eliminate the risk of leak due to differential deflection of the coupling joints on each side of the branch fitting, effectively creating equal support across the joints.

This will, however, create a rigid connection in the pipe wall, posing another, albeit smaller, potential risk. If the bedding and side support in the "flexibly" supported pipe immediately adjacent to the rigid encasement is not adequate, the resulting stress in the pipe wall where the encasement ends could be sufficient to damage the pipe wall. Excellent bedding and side support at this transition is critical for long term success.

Figure 2 is the recommended encasement configuration for HOBAS branch fittings.

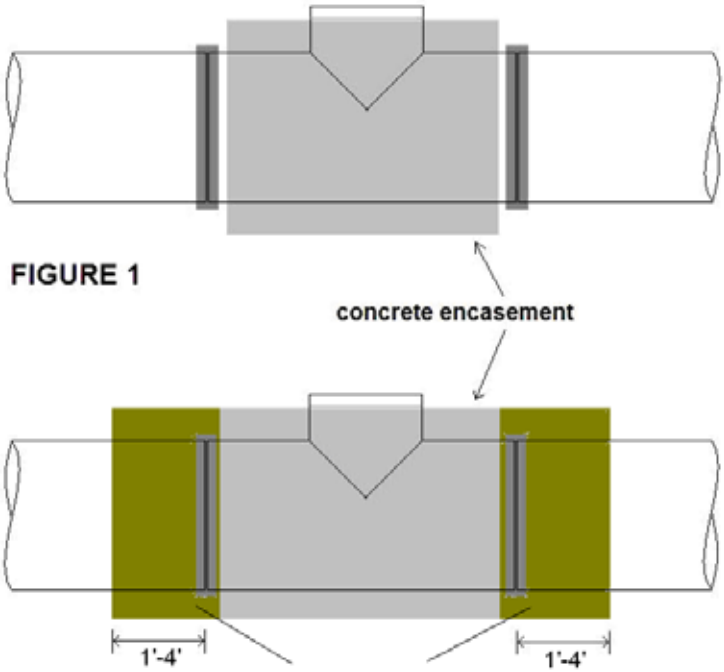


FIGURE 1

FIGURE 2

Conclusion:

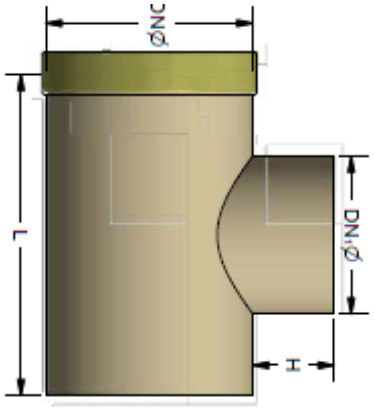
For branch fittings with thru-pipes of 48" and larger, HOBAS' experience indicates extending the concrete encasement past the joints by about 1' – 4' (depending on diameter) is advisable. If the fitting encasement is pre-cast (aboveground), cementstabilized sand (CSS) can be used for the 1' to 4' extension of rigid support past the couplings. The cement-stabilized sand should be allowed to set and achieve specified compressive strength prior to backfilling the trench to grade. Excellent bedding and side support is critical in the elastically supported pipe adjacent to the end of all encasements.

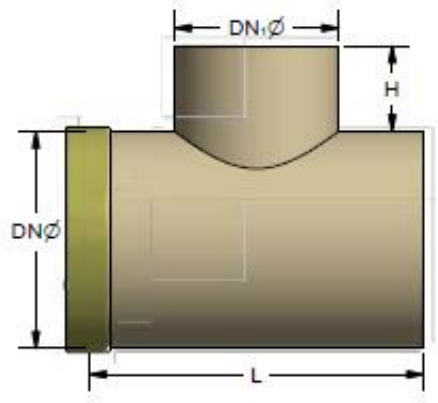
Other:

Concrete caps or cradles (partial encasements) are not recommended due to potential for stress concentration development at the interphase of rigid (concrete) to flexible (stone or compacted sand) support. All flowable fills, concrete encasements, CLSM, etc…should completely surround the fitting and extend past fitting joints by 1' to 3' as indicated above.

Sample branch fittings to encase & keep from deforming:

Lateral Tee





Vertical Tee (Tee Base MH or sim.)