

Clay rigid pipes and abs pipes engineering essay

[Engineering](#)



**ASSIGN
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a) Briefly explain with aid of diagramme , the construction methodology of laying a sewerage pipes and describe the reasons of different bedding type for vitrified clay (rigid) pipes and ABS (flexible) pipes.

A sewerage pipes can be defined as an underground pipe lines or channel owned and maintained by a statutory body. It is also known as a foul sewer. It is also one types of underground carriage pipes transporting sewage from houses or industry to treatment or disposal. Usually in some areas, sanitary sewers are separate sewer systems specifically for the carrying of domestic and industrial wastewater. It is operated separately and independently of storm drains, which carry the runoff drain and other water which wash into city streets. Sewers carrying both sewage and stormwater together are called combined sewers. There are several stages of construction methodology of laying a sewerage pipes. There are :-

Survey line and grade

Set Temporary Bench Marks (TBM'S) at a maximum five hundred (500) foot interval
Check line and grade of the pipe by laser beam method
<http://www.trenchlessonline.com/pix/stories/2009/02/DD-0209-Italy-2.jpg>
Survey line and grade pipe

2) Pipe preparation and handling

All pipe and fittings shall be inspected priors to lower the trench
This is to insure no cracked, broken, or defective materials are being used
Clean ends of pipe thoroughly
Remove foreign matter and dirt from inside of pipe
Keep clean during and after laying
Proper implements, tools, and facilities shall be used for the safe and proper protection of the work
Pipe shall be lowered into
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the trench to avoid any physical damage to the pipe. Pipe shall not be dropped or dumped into trenches.

3) Sewer pipe laying

Laying of sewer pipe shall be accomplished to line and grade in the trench. The trench has been prepared accordance with specifications outlined. Mud, silt, gravel and other foreign material shall be kept out of the pipe and off the jointing surface. Pipe laid shall retained in position. To maintain alignment and joint closure, hold the pipe in place. Pipe shall be laid to conform to the line and grade shown on the PLANS. Variance from established line and grade. Any point along the length of the pipe not be greater than one-thirty second of an inch per inch of pipe diameter and not to exceed one-half ($\frac{1}{2}$) inch. Sewer pipe shall laid up grade from point of connection on the existing sewer. Sewer pipe shall be installed with the bell end forward. Pipe Laying. The open end of the pipe shall be kept tightly closed when pipe laying is not in progress.

Pipe Laying

4) Trench Preparation and pipe bedding http://t1.gstatic.com/images?q=tbn:ANd9GcSYGXs9BeJzj6Rqpjc9SpxgDT4pzBhPPmZd1B--kIIYFahmHhk&t=1&usg=__a8D7__nswXyvhFrE7loz-adT3sg Trench is excavate and dewatering. Material is backfill, compact, fill and grading. Trench excavation

5) Placement of pipe bedding material

Hand-grade bedding to proper grade ahead of pipe laying operation. Bedding shall provide a firm, unyielding support along the entire pipe length. Fill the excess depth with pipe bedding material to the proper grade. Excavate bell

holes at each joint to permit proper assembly and inspection of the entire joint
http://t0.gstatic.com/images?q=tbn:ANd9GcSZ-c1Rt0QvvPqtWD60Zvvhshutym0G2x_cYuoXQ4MtnzpY3Vc&t=1&usg=__9b4JnPNq9ci3aVZ3Qmn052Lu7gc Placement of pipe bedding

6) Depth of bedding material

Provide pipe bedding material in accordance with the Standard Drawing.

7) Gravity pipe and water main separation

Gravity sewers that are laid in the vicinity of pipe lines designated to carry potable water

8) Plugs and connections

Plugs for pipe branches, stubs or other open ends shall be made of an approved material secured in place with a joint comparable to the main line joint.

9) Pipe jointing

Reinforced concrete pipe shall be placed in a vertical plane (top or bottom) when the pipe is laid. All pipe shall be installed to the homing mark on the spigot.

The different type of bedding of vitrified clay (rigid) pipes and ABS (flexible) pipes.

There are numerous classes of bedding for drainage and designed to suit all sorts of ground conditions. It same goes to rigid and flexible pipes. These are strict guidelines for pipe bedding on new installations which are carried over into the excavation and repair procedures.

Bedding detail for flexible pipes (Plastic) Bedding detail for rigid pipes(Clayware)

[www. draindomain. com_clay_drain_pipe_bedding](http://www.draindomain.com_clay_drain_pipe_bedding)
www. draindomain. com_plastic_drain_pipe_bedding

Reasons of different types of bedding pipes

Flexible pipes(plastic)

Rigid pipes(Clayware)

Plastic pipes are much lighter compare to the clay pipes. Clay are much heavier compare to the plastic pipes Flexible pipe is easily to handle Rigid pipe is hard to handle Distributing the imposed vertical loads to the surrounding soil. Withstand most anticipated live and dead loads Outward deflection No deflection Plastic pipe work relies on the granular fill around it for structural support Clay pipes can lead to stress fractures and collapse when bedded to appropriate granular material. Take the place of the traditional clay Clay pipes easily to cracks and fracture Good bedded system Poorly bedded system

b)List down with explanation the contractor task in landscaping contract

Landscape contractor is a person who responsibilities to supervise the creation of a new landscape, including construction, preparation of the soil, and planting. It is usually in accordance with plans drawn up by a garden designer or landscape architect. There are various forms of landscaping contract work. There are :

Landscape design

Landscaping contractor is also qualified in design the landscape. They have either earned trade certificates incorporating design or gone through formal landscape design courses. Nowadays, landscape design is a major commercial interest in the industry . It is a natural part of the landscaping contractor's business. Many landscaping contractors have the responsibilities to advice to clients as part of their roles.

Landscape Construction

This is the work that creates landscaping designs. It may involve the following: Construction of a completely new set of landforms and features
Construction of gardens
Placement of retaining walls
Installation of drainage
Installation of water features
Tree planting
Turfing
Installation of fixed watering systems

3)Landscape Remediation and Repair

There are several task and skills involved in this process and some of them include aspects of construction. It is common for landscaping contractors to repair or restore landscaping that has been affected by local conditions or subsidence or that requires management due to neglect. The repairing process will involve checking the planting area for discrepancies and checking the plant condition and type upon delivery.

Landscape Maintenance

This will include many skills and tasks as the remediation and repair over time. Maintenance is need to make sure the plant will withstand at its place and grow healthy . Watering and tending process are need for every plant

according to the specify period. Landscaping contractors have the authority to maintain the expensive features for owners and local governments. Landscaping contractors have the right to prune trees, remove noxious weeds, maintain the grass, proper storage for the plants and deal with any damage from environment disturbances such as storms, floods or heavy rains. Depending on their contracts, landscaping contractors also remove hazards. This is an extremely variable workload, and may include a very wide range of jobs and tasks on a daily basis. These are some of the examples: Earth movingTerracingDrain digging and installationConstruction of landscape features like retaining walls and garden bedsTurfingConcretingSetting up external area lightingInstalling or maintaining sprinkler or drip systemsWaste removalConstruction and installation of garden features like statues, windbreaks and privacy screensPlanting gardens and trees according to landscape plansThe type of landscaping is actually depending on the size of the area and the landscaping contractor's business. Plus, it also depends on the cost of the owner or the local authority to design their own landscape .

c) Briefly explain three(3) influencing factors for road design

Road can be defined as a route, way or path , that connect one to another, located between two places. It also known as public roads, especially major roads connecting significant destinations known highway. It usually use by human to travel from one destination to another destination with or without using the vehicles. For those who have transport, road provides a flat surface for comfortable journey to travel. Besides that, road help public to transfer and distribute the transportation on the ground. Road also helps to prevent

ground surface being damage from weather effects such as soil erosion, earthquake and flood . There are several factors that influence for road design. There are:-

Type of subgrade

Subgrade is actually one of the most important part of embankment fills or natural surface below the sub-base layer, road-base layer, base course and wearing course of road pavement and shoulder. The surface above the subgrade is known as the formation level . Subgrade is in situ material upon which the pavement structure is placed or constructed at selected location. Formation level can be defined as the final level of soil surface after completion of earthworks after going through the process of compaction, stabilization and reinforced. The function of subgrade is to withstand the loading of road pavement which is sub-base, road-base, base course and wearing course above it. <http://www.civilcraftstructures.com/wp-content/uploads/2010/03/ccs-typical-layers.jpg>

Classification of subgrades for concrete roads and minimum thicknesses of sub-base required

Type of subgrade

Definition

Minimum thickness of sub-base required

WeakAll subgrades of California Bearing Ratio(CBR) value 2 per cent or less150NormalSubgrades other than those defined by the other categories80mmVery stableAll subgrades of California Bearing Ratio(CBR)

value 15 per cent or more This category includes undisturbed foundations of old roads

b) Appearance of road design

Before construct the road, site clearing of that particular area must be clear. The contractor must use a dozer or grader for the works. The hedges and grass roots can be removed by using dozer. Grader is usually for grubbing works where the topsoil needs not to remove form site. After the site clearing, cut and fill process has taken place. Cutting process is the process where formation level is lower than original ground level. However, the filling process is the process where formation level is higher than the original ground level. After cut and fill, the contractor must prepare for the preparation of sub-base layer. It contains 300mm thick or sand or quarry dust. It usual compacted by 8 or 10 tonne smooth wheeled roller at 125mm layer every 12 times. The rolling process start from one side of the road to the center of road in horizontal direction. For the construction of the road base, it will divided into two layer with same thickness with each layer not more than 150mm thick . The material use is crusher run that functioned for levelling the surface . Using 10 tonnes roller to compact the surface. For the surfacing of the road, which is the last process, there can be divided into two stages . The base course and wearing course construction. Prime coat must be laid on the road and act as a binder with the base course compaction size 12. 5mm to 19mm laid by using paver machine. The compaction shall be done quickly. After the construction has been made, the surface of the road must be flat . The road must provide safety sign for the public. So, public can use the road safely and prevent less accident occur especially during the

rainy season. Plus, public can travel from one place to another by using safety road. Besides that, the road must be safety to use for the public eventhough, with or without using the transports. For the design of the roundabouts, all measures were taken to ensure they would be as safe as possible. Measures are include keeping sightlines of 40 metres to allow clear vision of the round use about and its surrounding footpaths, something of high importance in an area with high pedestrian traffic. It also protects pedestrians in the footpaths from vehicles performing hazardous right hand turns to enter properties.

c)Maintenance cost

Road must be maintained for long run. Like all structures, road will deteriorate over time. This is due to the damage made by the vehicles and the environment effects such as thermal cracking and oxidation often contribute. Maintenance cost is considered in the whole life cost of the road. It starts form the beginning of the construction of the road until the road has been completed. The measurements the for the maintenance include road curvature, cross slope, unevenness, roughness and texture of the road. If there are more crack due to the environment effect or damage made by the vehicles, the cost for the maintenance of the road will increase.

d)Briefly explain 4 requirements of joints for cladding system

Cladding act as a covering of one material with another. It also acts as a curtain wall panel system for the certain building . For example, 88-storey Petronas Twin Tower are clad with 83, 500m² of stainless steel extrusions and 55, 00m² of laminated glass. It also represent that the first building used

of custom-made 20. 38mm laminated light green glass in a building in Malaysia . The cladding is subjected to various loads, generated by the environment and occupancy, including windloads, self weight and impact loads. Inappropriate design can lead to cladding collapsing or being torn from the structure. There are several materials for cladding. There are formed metal including profiled metal, curtain walling glazing system, sheet metal, composite metal panels , and rain screens, glass fibre reinforcement cement, timber cladding, precast concrete cladding and glass reinforced polyester. So, these are the requirements of joints for cladding system :-

a)Strength

The cladding of the building should be designed to have an adequate strength, both in the panels and their connections to the structure. The performance criteria are established in various publications. The structure and the cladding of a building are the two principal components of the fabric of the building. The interaction between cladding and the structure must consider load transfer and relative movement. The connections of the cladding to the structure should recognise the different types of loads that are being transferred such as dead load or wind load. For example, in curtain walling , there are often connections are designed to transfer both dead loads and live loads with others carrying only wind loading. connection cladding

b)Weatherproof joints

Joint between frame and infill panels take the form of beads, gaskets and sealants. These are several requirement of cladding for curtain walling-glazing systems. The joints should be wind-and rain proof (if the inside of the <https://assignbuster.com/clay-rigid-pipes-and-abs-pipes-engineering-essay/>

infill panel is sensitive to moisture, the edge should be protected). The self weight of panels and wind loads should be transferred evenly to the frame. Panels and framing members should be free to expand and contract independently. Besides, joints must allow for dimensional and alignment variations between shop and site. The open joints allow water to enter the joint, control its passage and provide drainage . However, closed joints form a completely weatherproof barrier. Open joints have several advantages. They easily accommodate movement, erection is quick , and subsequent maintenance of joint seals is reduced . However, the joint profile tends to be more complicated.

c)Wind loading

Cladding must sustain wind and rain especially when there has great pressure. All types of cladding has the requirements to exclude wind and rain. For example, for glass-fibre-reinforced cement(GRC) , 10-12mm flat sheets will span 1. 0 metre under a wind pressure of 1. 0 N/m², but sheet of the same thickness can be profiled or ribbed to span up to 4. 0m under the same wind pressure. For greater spans or wind pressure , it may be necessary to design using sandwich construction, ribs construction or stud frame construction . For example, in sandwich construction two skins of GRC are separated by an insulating core . The edge of panels usually formed by bringing the two laminates together. In order to ensure maximum structural connection between skins, it is customary to use glass -reinforced polyester(GRP) connectors at intervals when using foamed polyurethane. However, problem can occur because of the differential expansion and

contraction rates of the skin and core . With poor bonding of core to face , surface blistering may occur.

d) Thermal expansion

There are some characteristics for thermal expansion. Usually there use a 20mm single skin glass-fibre reinforced cement(GRC) construction of approximately density 1800-2100 kg/m³ . For example, glass-reinforced polyester has a lower coefficient of thermal expansion than those of other plastics, but higher than those of steel , glass or concrete , and similar to that of aluminium and wood . The coefficient of expansion is linked to the amount of glass -fibre content in the laminate . The higher the glass fibre content , the lower the coefficient of the expansion of the glass- reinforced polyester(GRP). The expansion rate for a chopped strand mat laminate is higher than that of a combination of chopped strand mat and woven rovings. In calculating, the thermal movements the designer needs to assume a realistic figure for the temperature gradient set up within the cross -section of the panel

e) Good Durability

Durability refers to the material's ability to fulfil its intended function , both technical and aesthetic, over time. For example of timber cladding, high moisture contents reduces the strength of the wood, but within the normal range of variation of moisture content in use, loss of strength is not significant . In the case of exterior cladding, the main threats to durability are biological. Many potentially harmful organisms thrive in a humid environment. Exposure to ultraviolet light can result in bleaching , as can exposure to moisture . Loss of colour of unfinished wood by light and water is <https://assignbuster.com/clay-rigid-pipes-and-abs-pipes-engineering-essay/>

unavoidable , and indeed is often desired effect. However, problems will arise if some parts of the cladding are more exposed to the elements than others, loss of colour will be uneven and unattractive. Moreover, because wood has a natural acidity , mild steel will corrode more rapidly when exposed directly to moisture. Particularly the wood has a high tannin content, this can lead to severe staining of wood.