2067

Civic Engineers

Wrea Green

Wrea Green Drainage Spec

28-10-2024

Contents

D20
Excavating and filling

Generally/the site

110 Site investigation

1. Report: To be conducted by contractor. Report to be submitted to Civil Engineer for review.

145 Variations in ground water level

1. Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured.

150 Existing services, features and structures

1. Services: It is the contractor's responsibility to locate and mark the positions of all services affected by the work. Arrange with the appropriate authorities for the location and marking of the positions of mains services.

Clearance/excavating

164 Tree roots

1. Give notice of roots exceeding 25 mm and do not cut without approval.
2. Cutting
    2.1. Make clean smooth cuts with no ragged edges.
    2.2. Pare cut surfaces smooth with a sharp knife.
    2.3. Treatment of cut roots: Not required.
3. Backfill: As dug material, enriched with phosphate fertilizer.

168 Site clearance

1. Timing: Before topsoil stripping, if any.
2. General: Clear site of rubbish, debris and vegetation. Do not compact topsoil.
3. Treatment: Apply a suitable non-residual herbicide to areas to receive planting.

170 Removing small trees, shrubs, hedges and roots

1. Identification: Clearly mark trees to be removed.
2. Small trees, shrubs and hedges: Cut down.
3. Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
4. Safety: Comply with Forest Industry Safety Accord safety leaflets.

180 Chipping and shredding

1. General: Permitted, remove arisings from site

220 Stripping topsoil

1. General: Before beginning general excavation or filling, strip topsoil from areas where there will be regrading, buildings, pavings/ roads and other areas shown on drawings.
2. Depth
    2.1. Remove to an average depth of 150mm minimum.
    2.2. Give notice where the depth of topsoil is difficult to determine.

3. Handling: Handle topsoil for reuse or sale in accordance with clause 225.
4. Around trees: Do not remove topsoil from below the spread of trees to be retained.
5. Site storage: Keep separate from excavated sub-soil.

221 Treating topsoil

1. Treatment: Apply a suitable translocated nonresidual herbicide.
2. Timing: Not less than two weeks before excavating topsoil.

225 Handling topsoil

1. Standard: To BS 3882.
2. Aggressive weeds
   2.1. Species: Notify the presence of species included in the Weeds Act, section 2, or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
   2.2. Give notice: Obtain instructions before moving topsoil.
3. Contamination: Do not mix topsoil with:
   3.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
   3.2. Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
   3.3. Oil, fuel, cement or other substances harmful to plant growth.
   3.4. Other classifications of topsoil.
4. Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

1. Backfill material to new excavation:

250 Permissible deviations from formation levels

1. Embankments and cuttings: ±50 mm..

260 Inspecting formations

1. Give notice: Make advance arrangements for inspection of formations for trenches.
   1.1. Notice (minimum): 5 days.
2. Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels.
   2.1. Loose material: Remove.
3. Seal: Within 4 hours of inspection, seal formations with concrete.

267 Inspection of formations in shrinkable soils

1. Inspect formation: For signs of conducting and fine moisture absorbing roots.
2. Give notice: If significant quantities of roots are visible in the formation or in the bottom 75 mm of the walls of the excavation.

310 Unstable ground

1. Generally: Ensure that the excavation remains stable at all times.
2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

330 Unrecorded features

1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

350 Existing watercourses

1. Diverted watercourses which are to be filled: Before filling, remove vegetable growths and soft deposits.

360 Excess excavation

1. Excavation taken wider than required
   1.1. Backfill: As instructed.
2. Excavation taken deeper than required
   2.1. Backfill: With well graded granular material or lean mix concrete.

Disposal of materials

410 Excavated topsoil storage

1. Storage: Stockpile in temporary storage heaps.

415 Excavated topsoil removal

1. General: Remove from site.

420 Topsoil storage heaps

1. Location: To be specified by contractor.
2. Standard: To BS 3882.
3. Height (maximum): To be specified by contractor.
4. Protection
   4.1. Do not place any other material on top of storage heaps.
   4.2. Do not allow construction plant to pass over storage heaps.
   4.3. Prevent compaction and contamination.

421 Topsoil storage heap treatment

1. Treatment: Apply a suitable herbicide at appropriate times to prevent seeding of weeds.

441 Surplus subsoil

1. Excavated material: Stockpile in temporary storage heaps.
2. Retained material: Spread and level surplus subsoil on site.
   2.1. Locations: To be specified by contractor.
   2.2. Protected areas: Do not raise soil level within root spread of trees that are to be retained.
3. Remaining material: Remove from site.

450 Water

1. Generally: Keep all excavations free from water until:
   1.1. Formations are covered.
   1.2. Below ground constructions are completed.
   1.3. Basement structures and retaining walls are able to resist leakage, water pressure and flotation.

2. Drainage: Form surfaces of excavations and fill to provide adequate falls.
3. Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

454 Ground water level, springs or running water

1. Give notice: If it is considered that the excavations are below the water table.
2. Springs/ Running water: Give notice immediately if encountered.

457 Pumping

1. General: Do not disturb excavated faces or stability of adjacent ground or structures.
2. Pumped water: Discharge without flooding the site or adjoining property.
3. Sumps: Construct clear of excavations. Fill on completion.
   3.1. Locations:

460 Permanent drainage system

1. Disposal of water from the excavations through system: Permitted.

Filling

500 Proposed fill materials

1. Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
   1.1. Type and source of imported fill.
   1.2. Proposals for processing and reuse of material excavated on site.
   1.3. Test reports as required elsewhere.
2. Timing: At least 21 days before starting filling

510 Hazardous, aggressive or unstable materials

1. General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
   1.1. Frozen or containing ice.
   1.2. Organic.
   1.3. Contaminated or noxious.
   1.4. Susceptible to spontaneous combustion.
   1.5. Likely to erode or decay and cause voids.
   1.6. With excessive moisture content, slurry, mud or from marshes or bogs.
   1.7. Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
   1.8. Unacceptable, class U2 as defined in the 'Specification for highway works', clause 601.

512 Limitation of sulfate content in fill materials

1. Test specification: To BRE Report 279
2. Certificates of test result: Submit.

520 Frost susceptibility

1. General: Except as allowed below, fill must be non frost-susceptible as defined in the 'Specification for highway works', clause 801.8.

2. Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost- susceptible:
   2.1. Fine grained soil with a plasticity index less than 20%.
   2.2. Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
   2.3. Crushed chalk.
   2.4. Crushed limestone fill with average saturation moisture content in excess of 3%.
   2.5. Burnt colliery shale.
3. Frost-susceptible fill: May only be used:
   3.1. At depths below the finished ground surface greater than:
   3.2. Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
   3.3. Where frost heave will not affect structural elements.

525 Testing of suitability of fill materials before start of filling

1. Laboratory: UKAS accredited laboratory
2. Submit report to: Civil Engineer (two copies)
   2.1. Timing: 21 days before starting filling
3. Samples: Deliver to laboratory as required.
4. Tests: As directed
5. Frequency: Submit with tender proposed rate and frequency of testing to demonstrate continuing compliance of imported or reprocessed fill with specified properties

530 Placing fill

1. Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
2. Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
3. Adjacent structures, membranes and buried services
   3.1. Do not overload, destabilise or damage.
   3.2. Submit proposals for temporary support necessary to ensure stability during filling.
   3.3. Allow 14 days (minimum) before backfilling against in situ concrete structures.
4. Layers: Place so that only one type of material occurs in each layer.
5. Earthmoving equipment: Vary route to avoid rutting.

535 Compaction generally

1. General: Compact fill not specified to be left loose as soon as possible after placing.
2. After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
3. Defective areas: Remove and recompact to full thickness of layer using new material.

540 Benching in fill

1. Adjacent areas: If, during filling the difference in level between adjacent areas of filling exceeds 600 mm, cut into edge of higher filling to form benches 600 mm minimum width and height equivalent to depth of a layer of compacted filling.
2. New filling: Spread and compact to ensure maximum continuity with previous filling.

610 Compacted filling for landscape areas

1. Fill: Material capable of compaction by light earthmoving plant.
2. Filling: Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.

615 Loose tip filling for landscape areas

1. Filling: Do not firm, consolidate or compact when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

617 Type 1 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 803:
   1.1. Crushed rock (other than argillaceous rock).
   1.2. Coarse crushed concrete aggregate.
   1.3. Recycled aggregates.
   1.4. Crushed non-expansive slag to clause 801.2.
   1.5. Well-burned non-plastic colliery shale.
2. Amendments to requirements in the 'Specification for highway works':
3. Filling: To 'Specification for highway works', clause 802.

618 Type 2 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 804:
   1.1. Crushed rock (other than argillaceous rock).
   1.2. Coarse crushed concrete aggregate.
   1.3. Recycled aggregates.
   1.4. Crushed non-expansive slag to clause 801.2.
   1.5. Well-burned non-plastic colliery shale.
   1.6. Natural gravel.
   1.7. Natural sand.
2. Amendments to requirements in the 'Specification for highway works':
3. Filling: To 'Specification for highway works', clause 802.

620 Subgrade improvement layer (capping)

1. Fill: To 'Specification for highway works', Table 6/1, Class 6F1 or 6F2.
2. oFilling: Place and compact to MCHW Volume 1: 'Specification for highway works' (SHW), Table 6/1, clause 612 and clause 613.3, 613.9 and 613.10.

621 Type 3 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 805:
   1.1. Crushed rock (other than argillaceous rock) with well-defined edges.
   1.2. Coarse crushed concrete aggregate.
   1.3. Crushed non-expansive slag.
2. Amendments to requirements in the 'Specification for highway works':
3. Filling: To 'Specification for highway works', clause 802.

622 Type 4 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 807:

1.1. Asphalt road planings.
1.2. Granulated asphalt.
1.3. Crushed rock (other than argillaceous rock) with well-defined edges.
1.4. Coarse crushed concrete aggregate.
1.5. Crushed non-expansive slag.
1.6. Well-burned non-plastic colliery shale.

2. Amendments to requirements in the 'Specification for highway works':
3. Filling: To 'Specification for highway works', clause 802.

626 Compacted general fill

1. Suitable material: Any inorganic material excavated on the site
2. Excavated material: Select suitable material and keep separate.
3. Filling: Spread and level material in layers. As soon as possible thoroughly compact each layer.
4. Required compaction:
5. Proposals: Well in advance of starting work submit details of proposed:
   5.1. Materials to be used, including quantities of each type.
   5.2. Type of plant.
   5.3. Maximum depth of each compacted layer.
   5.4. Minimum number of passes per layer.

640 Starter layer of compacted filling

1. Fill: Suitable hard granular material. Compact thoroughly.
2. Thickness: 450mm

650 Protection of compacted filling

1. Temporary protective filling: Before allowing construction traffic, raise level of compacted cohesive soil filling at least 150 mm above formation level using properly compacted temporary filling.
2. Removal: Remove temporary protective filling from site before permanent construction.

Ω End of Section

R13
Land drainage

Generally

100 Existing drains and watercourses

1. Pre-commencement checking: Before starting work, check invert levels and positions of existing drainage against drawings. Report any discrepancies
2. Drains to be retained: Protect. Maintain normal operation. Show location on drawings

103 Sequence of work

1. General: Work shall commence downstream and proceed upstream of proposed land drainage network – whilst maintaining existing normal operation.

106 In situ concrete (general)

1. Standard: To BS 8500-1 and -2.
    1.1. Concrete: Designated on drawing 2067-CIV-XX-XX-D-C-32001.

Culverts

401 Culvert

1. Excavation: To profile and gradient necessary for pipe.
2. Pipe bedding: Designated on drawing 2067-CIV-XX-XX-D-C-31003
    2.1. Recycled content of granular material: Not applicable.
3. Pipes: Designated on drawing 2067-CIV-XX-XX-D-C-31003
    3.1. Manufacturer: To be specified by contractor.
    3.2. Sizes: 450mm, 600mm
    3.3. Recycled content of plastics pipes: Not applicable.
    3.4. Perforations: None.
4. Laying: Pipe invert at upstream end to be below bottom of ditch
5. Pipe surround and backfill
    5.1. Material designated on drawing 2067-CIV-XX-XX-D-C-31003
    5.2. Recycled content of granular material: Not applicable.

Excavating/ beddings/ surrounds/ backfill

500 Topsoiling

1. Segregation: Carefully remove topsoil when forming trenches and prevent mixing with subsoil.

505 Excavation

1. Pipe gradients: Designated on drawing 2067-CIV-XX-XX-D-C-31003
2. Subsoil:
    2.1. Treatment: Remove from site or to approved locations at end of each day and before pipe laying. Do not disperse on topsoiled areas
    2.2. Approved locations: To be specified by contractor.

515 Existing live land drains

1. Drains exposed by excavation: Mark positions
2. Cutting out: Carefully break back piped drains to an undisturbed section
3. Reconnection: Connect exposed drain to new work
4. Record drawing: Show position of exposed system and new connections. Submit copy

520 Formation for beds or pipes

1. Timing: Excavate to formation immediately before laying beds or pipes
2. Hard spots: Remove rock projections, boulders, etc. Replace with consolidated bedding material
3. Soft spots: Tamp in bedding material
4. Inspection:
   4.1. Requirement: Give notice of completed excavated formation for each section of the work
   4.2. Period of notice (minimum): Five working days

525 Granular beds

1. Compacted thickness (minimum): 50mm
2. Laying pipes: Scoop out locally at couplings and sockets and lay pipes digging slightly into bed and resting uniformly on their barrels. Lay to line and gradient without backfalls.

540 Granular surround and backfill – surface water drains

1. Material: Clean gravel, broken stone, hard clinker or slag, with no fines, graded 75 to 20 mm or approved recycled material

555 Granular backfilling to drains with pipes

1. General: Not applicable to narrow trenches where a backfill is placed continuously by machine
2. Placing: In maximum 300 mm thick layers, with mechanical compaction from 300 mm above crown of pipe, up to finished ground level
   2.1. Surround and backfill material: Do not heap in the trench before spreading
   2.2. Packing: Carefully pack material around the sides of the pipe. Prevent damage or disruption to pipelines and compact thoroughly

560 Granular backfilling to drains without pipes

1. General: Not applicable to narrow trenches where a backfill is placed continuously by machine.
2. Placing: Backfill in maximum 300 mm thick layers, with mechanical compaction, up to finished ground level

565 Backfilling with as-dug material

1. General: Not applicable to narrow trenches where a backfill is placed continuously by machine.
2. Material: As excavated from the trench
3. Placing and compaction: Maximum 300 mm thick layers, up to finished ground level. Compact each layer before placing the next
4. Heavy compactors: Do not use before there is 600 mm of material over pipes

570 Installing geotextile trench lining

1. Preparation: As per product manufacturer requirements.
2. Placing

2.1. Dressing geotextile: Uniformly to trench profile without stretching, perforation or rupture Protect geotextile trench lining from damage during subsequent construction

2.2. Top level: 300 mm below ground level

2.3. Top of aggregate: Wrap free lengths of geotextile over top surface and overlap by 300 mm. Tuck top layer down trench side by 100 mm

Ancillary constructions and work

700 Outlet headwalls

1. Description: Designated on drawing 2067-CIV-XX-XX-D-C-31001.

710 Inlet headwalls

1. Description: Designated on drawing 2067-CIV-XX-XX-D-C-31001.

800 Cleaning

1. General: Thoroughly flush out the whole of the installation with clean water to remove silt and debris immediately before handover
2. Preparation: Remove mortar droppings, debris and loose wrappings.
3. Timing: Before cleaning, final testing, CCTV inspection (if specified), and immediately before handover.
4. Cleaning: Thoroughly flush any pipes with water to remove silt and check for blockages. Where appropriate, rod pipes between access points if there is any indication that they may be obstructed.
5. Washings and detritus: Dispose of safely. Do not discharge into sewers or watercourses.
6. Covers: Not applicable.

Ω End of Section

Specification created using NBS Chorus