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Technical ExaminationCivil Engineering Technology C.E.T

CTTAM Civil-Engineering-Technology

Version Demo

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QUESTION NO: 1

During proof rolling of prepared subgrade, a loaded truck causes localized pumping and visible rutting in an area intended for pavement construction. What is the most appropriate action?

A. Place granular base immediately to confine the unstable material.

B. Stop work in the affected area, delineate it, and obtain direction for remediation.

C. Increase the number of proof-roll passes until rutting stops.

D. Accept the subgrade if it meets the design elevation.

ANSWER: B

Explanation:

The appropriate action is to **stop work in the affected area, delineate the unstable subgrade, and obtain direction for remediation**. Pumping and rutting indicate that the subgrade may lack adequate stability or contain excess moisture and unsuitable material. Placing granular base over the area can conceal the problem and lead to later settlement or pavement distress. The affected limits should be documented and reviewed so that suitable corrective work, such as undercutting and replacement, moisture conditioning, stabilization, drainage improvement, or additional geotechnical review, can be determined.

QUESTION NO: 2

Which of the following correctly indicates the information that must be provided on a site plan?

A. The legal description

B. Finish grades and setback distances

C. Finish grades and the legal description

D. Finish grades, setback distances, and the legal description

ANSWER: D

Explanation:

Finish grades, setback distances, and the legal description is correct because these items establish the essential property, regulatory, and physical information needed for a site plan. The legal description precisely identifies the parcel to which the drawing applies, connecting the proposed work to the applicable land records and surveyed property. Setback distances show the location of proposed construction in relation to property lines and applicable required yards, thereby allowing the authority having jurisdiction to assess land-use and zoning compliance. Finish grades communicate the intended final elevations and surface configuration of the site. They are necessary for evaluating drainage direction, grading transitions, relationships with adjoining land, and the practical implementation of site works. Together, these details enable review of whether the development is being placed on the correct property, within permitted building limits, and with a workable final drainage and grading arrangement. Site-plan requirements are ultimately established by the municipality or other authority having jurisdiction, but these categories are standard core components in development and permit submissions. For example, the City of Winnipeg's site-plan guidance identifies property information, setbacks, and proposed grades among required drawing information: City of Winnipeg—Site Plan Requirements. General site-plan drawing guidance is also provided by the Government of Alberta: Government of Alberta—Site Plan Example.

QUESTION NO: 3

A level is set up with a backsight of 1.315 m on a benchmark with a known elevation of 234.680 m. A foresight reading of 2.460 m is then taken on a proposed manhole rim location. What is the elevation of the proposed manhole rim location?

A. 232.220 m

B. 233.535 m

C. 235.825 m

D. 237.140 m

ANSWER: B

Explanation:

The elevation is **233.535 m**. The height of instrument is first determined by adding the backsight to the benchmark elevation: 234.680 m + 1.315 m = 235.995 m. The foresight is then subtracted from the height of instrument: 235.995 m − 2.460 m = 233.535 m. This elevation can be compared with the design rim elevation to determine the required adjustment during construction.

QUESTION NO: 4

An asphalt-concrete specification requires the mix to be at least 120°C at placement. A truck arrives at the paving site with a measured mix temperature of 105°C before unloading. What should the civil engineering technologist do?

A. Permit placement because the mix may become warmer during spreading.

B. Add water to improve the workability of the asphalt mix.

C. Not permit placement, document the nonconformance, and notify the contractor.

D. Place the mix and obtain a density core after the pavement has cooled.

ANSWER: C

Explanation:

The technologist should **not permit placement, document the nonconformance, and notify the contractor**. The measured temperature is below the specified minimum before the material has been placed and compacted. Asphalt that is too cold may not be adequately workable and can be difficult to compact to the required density, increasing the risk of poor bonding, excessive air voids, and premature pavement deterioration. The contractor or responsible party may seek a documented disposition if permitted by the contract, but the material should not be accepted for placement without authorization.

QUESTION NO: 5

Concrete cylinders are made from a structural slab placement. The consultant wants to evaluate whether cold-weather protection and curing at the site were adequate. Which specimens provide the most relevant information?

A. Standard-cured cylinders

B. Field-cured cylinders

C. Air-content test samples

D. Slump-test samples

ANSWER: B

Explanation:

Field-cured cylinders provide the most relevant indication of the effects of job-site curing and temperature conditions on the concrete. These specimens are stored and cured under conditions representative of the placed concrete. Standard-cured cylinders are important for evaluating the strength potential of the delivered concrete under controlled curing conditions, but they do not indicate whether the in-place work received adequate protection and curing. Both types of specimens may be required by the project specification, but field-cured cylinders are the appropriate specimens for the stated concern.

QUESTION NO: 6

What is a silt fence used for?

A. To mark the construction limits of the project

B. To prevent water from moving through the site

C. To prevent the public from accessing the construction site

D. To prevent soil from moving through the site due to erosion

ANSWER: D

Explanation:

A silt fence is used **to prevent soil from moving through the site due to erosion**. It is a temporary sediment-control practice commonly installed on construction sites at the downslope edge of disturbed soil or along contours where stormwater runoff could carry loosened sediment away. The geotextile fabric is supported by posts and installed with its bottom edge trenched into the ground so runoff is slowed and temporarily ponded. This reduction in flow velocity allows suspended soil particles to settle out, while the fabric and ponded water help retain sediment on the site. Proper placement, anchorage, and maintenance are essential because sediment must be removed when it accumulates and the fence must be repaired if undermined or damaged. Silt fencing is therefore part of a broader erosion-and-sediment-control plan that protects nearby drainage systems, watercourses, and adjacent properties from sediment-laden runoff during construction activities. The U.S. Environmental Protection Agency identifies silt fences as perimeter controls intended to retain sediment from disturbed areas, and the U.S. Department of Agriculture's Natural Resources Conservation Service provides installation and application guidance for this sediment barrier. See the EPA construction stormwater guidance and the NRCS Silt Fence standard.

QUESTION NO: 7

A civil engineering technologist is providing culvert location staking in the field for a project. What information is placed on the survey stakes?

A. Culvert top-of-pipe elevations and diameter

B. Culvert material type and thickness

C. Culvert manufacturer's name and material

D. Culvert invert elevations and offset to end of culvert

ANSWER: D

Explanation:

Culvert invert elevations and offset to end of culvert is the appropriate information because culvert staking must provide the construction crew with both the horizontal position and the controlling vertical grade for installation. The invert is the inside bottom, or flow line, of the culvert. Its elevation establishes the drainage path and allows the crew to set the culvert to the design slope so that water flows as intended. Recording an offset to the culvert end allows the point to be marked safely away from excavation, grading, and equipment activity while still giving the crew a measurable distance and direction to locate the actual inlet or outlet end. Together, invert elevations and offsets communicate the essential field layout information needed to place the culvert accurately and verify it against the design profile. This approach is consistent with standard roadway drainage practice, in which culvert hydraulic performance depends on the defined inlet and outlet elevations and

the resulting barrel slope. The Federal Highway Administration's Hydraulic Design of Highway Culverts discusses culvert profile and hydraulic controls, while its culvert installation guidance emphasizes accurate construction and grade control.