CTTAM.Civil-Engineering-Technology.v2026-11-23.q41

Exam Code:	Civil-Engineering-Technology
Exam Name:	Technical Examination - Civil Engineering Technology C.E.T
Certification Provider:	CTTAM
Free Question Number:	41
Version:	v2026-11-23
# of views:	107
# of Questions views:	410
https://www.exam-tests.com/Civil-Engineering-Technology-exam/CTTAM.Civil-Engineering-Technology.v2026-11-23.q41.html	

NEW QUESTION: 1
Which joints in concrete slab construction determine the location of cracks?
A. Expansion
B. Construction
C. Isolation
D. Control
Answer: D (LEAVE A REPLY)
Concrete slabs shrink as they cure and experience temperature/moisture changes. Because the slab is restrained by subbase friction and adjacent elements, tensile stresses develop and cracking is likely unless the slab is intentionally "weakened" at planned locations.Control joints(also called contraction joints) are formed or saw-cut to create a deliberate plane of weakness so that shrinkage cracking occurswhere intended, producing straighter, serviceable cracks that are easier to seal and maintain. Technical references describe contraction/control joints as placed at regular intervals specifically tocontrol random crackingby encouraging the crack to form along the joint line, relieving tensile stresses in the slab. Expansion joints address thermal expansion, isolation joints separate the slab from fixed elements, and construction joints occur where placements stop and start; none of those are primarily intended tocontrol crack locationthe way control joints are. Therefore, the joint type that determines where cracks occur is thecontrol joint.

NEW QUESTION: 2
The delay in the delivery of a critical item may affect the completion date for a project. Which of the following would be the best course of action?
A. Inform the client of possible delays.
B. Continue the work on the project as planned.
C. Tell the client that the delivery is on schedule.
D. Insist that the supplier meet the original delivery date.

Answer: A (LEAVE A REPLY)
Critical-item delivery risk is a schedule risk that can affect the project finish date, especially if the item lies on or near the critical path. Good project coordination requirestimely, accurate communicationto stakeholders and proactive risk management. Informing the client early allows transparent expectation management, supports decision-making on mitigation (re-sequencing, alternate materials, expediting, temporary works), and reduces the likelihood of disputes later.
Status reporting guidance emphasizes that project reports should communicate current issues/risks and their impacts so corrective actions can be taken and forecasts updated.
Withholding information (option C) is unethical and harmful; simply continuing as planned (B) ignores a known risk; insisting a supplier meet original dates (D) may be attempted but is not always feasible and does not replace proper stakeholder notification and replanning. Therefore, the best course is toinform the client of possible delaysand then coordinate mitigation actions through the project controls process.

NEW QUESTION: 3
Which are five different types of driver maneuvers a technologist must consider when designing an at-grade intersection?
A. Turning, Merging, Weaving, Crossing, Stopping
B. Diverging, Merging, Weaving, Crossing, Turning
C. Stopping, Turning, Weaving, Converging, Swerving
D. Swerving, Merging, Diverging, Crossing, Converging
Answer: (SHOW ANSWER)
At-grade intersection design is governed by how vehicle paths interact-i.e., the fundamentalconflict types and maneuver classes that must be accommodated by geometry, channelization, and traffic control. AASHTO' s intersection chapter explicitly categorizes vehicular conflict points and illustrates them using the maneuver typesdiverging, merging, and crossing, and it addresses how turning movements create and interact with these conflicts within the functional area of intersections.
In addition, AASHTO describesweavingas the condition where one-way traffic streams cross bymerging and divergingmaneuvers-another key operational behavior that affects design and level of service.
Putting these together, the five maneuvers a technologist must consider in intersection design arediverging, merging, weaving, crossing, and turning, which corresponds exactly toOption B.

NEW QUESTION: 4
Which of the following is employee's responsibility in regard to PPE?
A. Inspect PPE before use.
B. Select PPE appropriate for the hazard.
C. Receive training on the correct use of PPE.
D. Ensure PPE is maintained correctly between uses.
Answer: (SHOW ANSWER)

Employee responsibilities for PPE typically includeusing PPE as required and checking it is serviceable before use, then reporting defects. Employer responsibilities generally include hazard assessment, selecting
/providing appropriate PPE, ensuring training, and maintaining a program. EM 385-1-1 reflects this division of duties: it requires PPE to be used to control exposures and establishes training requirements covering key aspects of PPE, includinginspection/testingand proper care. Practical safety guidance for workers also states that employees shouldcheck PPE for faults before useand report issues. Among the optionsuployee duty that is broadly applicable across PPE types and aligns with standard safety systems: workers verify their equipment is not damaged, fits correctly, and is suitable for the task before entering the hazard area.
Therefore, the correct answer isA.

NEW QUESTION: 5
What does a system curve illustrate?
A. The total fl as related to time
B. The minimum radius at which a car can safely travel at 50 km/h
C. The total head loss in a system of pipes as related to total flow
D. The total length of the water mains as related to the water main diameter
Answer: (SHOW ANSWER)
Comprehensive and Detailed 150 to 200 words of Engineering documents and resources:
In pumped/pressurized pipe systems, thesystem curverepresents the hydraulic requirement of the piping network: the relationship betweenflow rate (Q)and thehead requiredto overcome elevation differences and losses. As flow increases, friction and minor losses rise (often approximately with Q^2 in turbulent flow regimes), so the system's required head increases with Q. This curve is used with a pump curve to find the operating point where pump head equals system head at a given flow.
Standard civil engineering hydraulics references define head loss as a function of flow through friction and fittings, and system behavior is expressed by total head (static + losses) versus flow, which is exactly what the system curve shows.
Therefore, the system curve illustratestotal head loss (and required head) in the pipe system as a function of total flow, matching optionC.

NEW QUESTION: 6
Which of the following tests are required as part of soil grain size analysis?
A. Sieve analysis for coarse grains and Atterberg limit tests for fine grains
B. Sieve analysis for coarse grains and hydrometer test for fine grains
C. Sieve analysis for fine grains and hydrometer test for coarse grains
D. Sieve analysis for fine grains and Atterberg limit tests for coarse grains
Answer: B (LEAVE A REPLY)
Soilgrain size analysisdetermines the particle-size distribution across coarse and fine fractions. Coarse particles (sand and gravel) are sized bysieve analysis, where the sample is passed through a stack of sieves and the mass retained on each sieve is measured to build the gradation curve.

Fine particles (silt and clay) are too small for practical sieving and are therefore sized usingsedimentation methods, most commonly the hydrometer test, which infers particle sizes from settling velocity in a suspension. This combined approach (sieve for coarse, hydrometer for fines) is standard in civil geotechnical testing programs because it produces a continuous particle-size distribution needed for soil classification and engineering assessment. Atterberg limits (LL/PL) areconsistency/plasticitytests for fine-grained soils-not grain size tests-so they are not the required fine-fraction method for grain-size analysis. Therefore, the correct combination for grain size analysis issieve analysis for coarse grains and hydrometer test for fine grains.

NEW QUESTION: 7
For granular material, what is the typical optimum moisture content for dry densities ranging from 2100 kg/m³ to 2200 kg/m³?
A. 4-7%
B. 8-15%
C. 16-20%
D. 21-25%
Answer: (SHOW ANSWER)
Theoptimum moisture content (OMC)is the moisture content at which a soil achievesmaximum dry density for a given compactive effort on the Proctor curve. Granular materials (sands/gravels with low plastic fines) typically requirerelatively low moistureto reach peak density because their structure densifies primarily by particle rearrangement; only a small amount of water is needed to lubricate contacts and aid compaction.
Training/compaction manuals define OMC as the peak of the moisture-density relationship and highlight that coarse-grained materials generally peak at lower moisture than fine-grained soils. A maximum dry density range of about2100-2200 kg/m³(#2.10-2.20 Mg/m³) is consistent with well-compacted granular base
/subbase, which commonly has an OMC in thesingle-digit percentrange. Therefore, the typical OMC range that best matches granular materials at these densities is4-7%.

NEW QUESTION: 8
EXCERPT FROM MUNICIPAL BYLAW 1234 - ZONING
Section 3: Single family zone
3.1 All dwellings shall house one family.
3.2 All dwellings shall have a minimum main floor area of 120 m².
3.3 All dwellings shall be constructed a minimum of 10.0 m from the front property line, 15.0 m from the rear property line, and 1.5 m from the side property lines.
3.4 An application that does not fulfill the above requirements shall be referred to Council.
A. Approve the application because it meets all requirements.
B. Reject the application because the rear yard setback is too large.
C. Refer the application to Council because it does not meet the requirements.

D. Reject the application because one of the side yard dimensions and the main floor area are not sufficient.

Answer: C (LEAVE A REPLY)

The bylaw excerpt establishes mandatory requirements (one family, minimum 120 m² floor area, and minimum setbacks) and then provides the required administrative action in Section 3.4:any application that does not fulfill the above requirements shall be referred to Council. The correct decision is therefore governed directly by the regulatory text: when any requirement is not met, the prescribed next step is referral rather than approval. Option C matches the bylaw's stated process exactly by directing the application to Council due to noncompliance. Options B and D propose outright rejection reasons that the excerpt does not authorize as the required action; the excerpt explicitly states "referred to Council" for noncompliant applications. Option A is only valid when all requirements are met. Accordingly, the correct response isrefer to Council.

NEW QUESTION: 9

Which soil test identifies the minimum water content at which the soil begins to crumble?

A. Liquid limit

B. Plastic limit

C. Shrinkage limit

D. Permeability limit

Answer: B (LEAVE A REPLY)

The Atterberg litent boundaries between consistency states of fine-grained soils. Theplastic limit (PL)is the water content at the boundary between theplasticandsemi-solidstates-below this moisture condition, the soil can no longer be rolled/deformed withoutcrumbling, indicating it has transitioned out of the plastic range.

Civil engineering references define PL explicitly as the water content corresponding to the transition between the semi-solid and plastic state (i.e., the lower boundary of plastic behavior). Similarly, soils testing references define PL as the boundary between plastic and semi-solid states (with liquid limit defining plastic-to-liquid boundary).

NEW QUESTION: 10

If a controlled product is used, stored, handled, or manufactured at a work site, what documents should be discussed at safety meetings with workers?

A. Material Safety Data Sheets (MSDS)

B. Product Application Procedures

C. Product Colour Board Samples

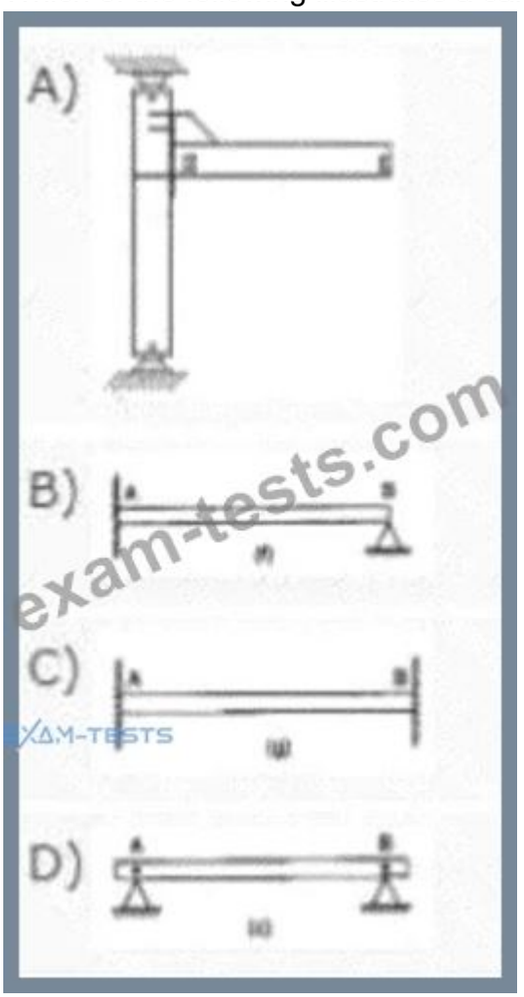
D. Workplace Hazardous Materials Information System (WHMIS)

Answer: A (LEAVE A REPLY)

Controlled products (hazardous products) require workers to understand the hazards, safe handling, storage, PPE, first aid, spill response, and emergency measures. The document that communicates this hazard and control information for each product is theMaterial Safety Data Sheet (MSDS)(now commonly SDS under GHS, but MSDS remains widely referenced in training/exams). Safety

systems require that these sheets be readily accessible and that workers be informed/trained on the hazards and controls associated with the products they use. EM 385-1-1 requires hazard communication, including that hazardous chemical information be available and communicated to personnel, and that safety meetings/training address hazard controls and safe work practices. In the WHMIS framework, WHMIS is the overall system, while the MSDS
/SDS is the specificproduct documentdiscussed and referenced for each controlled product. Therefore, the correct choice isMaterial Safety Data Sheets (MSDS).

NEW QUESTION: 11
Which of the following illustrates a cantilever?



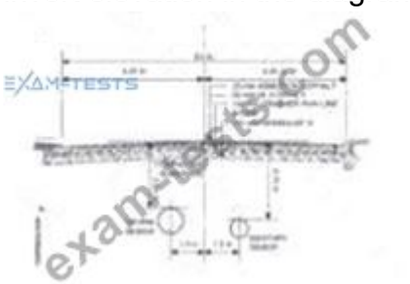
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A. (image option A)
B. (image option B)
C. (image option C)
D. (image option D)
Answer: A (LEAVE A REPLY)
A cantilever is defined as a beam or structural member that isfixed (built-in) at one end and free at the other
, resisting loads through bending and shear while the support provides the restraint against rotation and translation. Classic structural descriptions emphasize that a cantilever is "held only at one end while supporting weight or resisting motion all along its free length," which distinguishes it from

simply supported beams (supported at two ends) or fixed-fixed beams (built-in at both ends). In the provided options, the correct illustration is the one showing a member rigidly attached at one end (fixed support) and extending outward with the opposite end unsupported (free). That configuration matches optionA, while the other options depict different support conditions (e.g., simply supported or fixed at both ends). Therefore, the diagram that illustrates a cantilever isA.

NEW QUESTION: 12

A surveyor is laying out the invert elevations of a storm sewer. Centre elevation is 10 m, storm pipe outside diameter is 1 m, and storm sewer pipe wall thickness is 0.05 m. What is the storm sewer invert elevation in the diagram below?

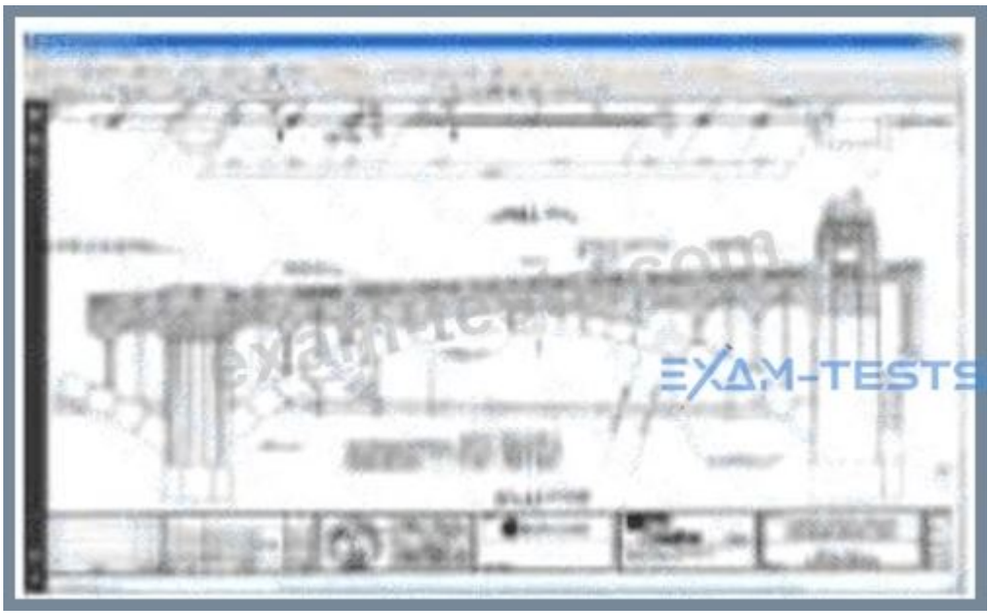


A. 6.50 m
B. 6.55 m
C. 6.75 m
D. 7.00 m
Answer: (SHOW ANSWER)

Theinvert elevationis the elevation of theinside bottomof the pipe (flow line). To compute invert from a reference elevation, the key geometry is theinside radius(half the inside diameter). Given an outside diameter (OD) of 1.00 m and wall thickness of 0.05 m, the inside diameter (ID) is: ID = 1.00 # 2(0.05) =0.90 m, so inside radius =0.45 m. The diagram indicates the pipe is located such that thepipe centreline elevationis at
7.00 m(derived from the shown vertical offset from the 10.00 m center elevation to the pipe center). The invert is therefore: 7.00 # 0.45 =6.55 m. Civil references define invert as the interior bottom of the conduit and use inside radius/diameter relationships when converting from centreline to invert. Hence, the correct invert elevation shown by the diagram and pipe geometry is6.55 m.

NEW QUESTION: 13

What is the primary force that a bridge in the diagram needs to resist?



A. Compression
B. Tension
C. Moment
D. Shear
Answer: A (LEAVE A REPLY)
The diagram depicts anarch-type bridge, where the load path is carried along the curved arch shape to the supports/abutments. In arch action, loads are transferred primarily ascompressive forcesthrough the arch ring
/rib; the structure pushes inward on itself while generating horizontal thrust at the abutments. Authoritative references describe that an arch bridge carries loads primarily bycompression, and the foundations/abutments must resist both vertical and horizontal components generated by that compressive thrust. Because the primary internal action in the arch member is compression (rather than tension in a cable, or bending- dominated action in a simple beam), the governing force type for the bridge form shown iscompression.

NEW QUESTION: 14
A civil engineering technologist is completing quality control for a municipal design. When checking design calculations, the technologist notices errors in the design and final design drawings made by a senior structural engineer. The technologist suspects that the errors may result in the failure of a suspended slab/roof car parking area. What should be the primary consideration in this situation?
A. Experience of a senior structural engineer should be considered.
B. Conflict of interest should be disclosed to the client.
C. Safety, health, and welfare of the public are of most importance.
D. Responsibility for professional assignments is undertaken only after sufficient training and experience has been obtained.
Answer: C (LEAVE A REPLY)
Engineering ethics and professional duty prioritizepublic protectionover hierarchy, convenience, or reputational concerns. Civil engineering ethics guidance explicitly states that engineers shallhold

paramount the safety, health, and welfare of the public, and that when professional judgment is overruled under circumstances endangering public welfare, the engineer is expected to notify the client or appropriate authority. This principle is repeated in civil engineering professional canons (e.g., ASCE Fundamental Canon
1) and is treated as the primary criterion even when it conflicts with other pressures. In this scenario, suspected structural failure risk for a public parking slab/roof is a direct life-safety concern; therefore the technologist's primary consideration must be ensuring the issue is elevated and addressed to prevent unsafe construction or operation. Other factors (seniority, conflict disclosure, competence) may be relevant in process, but none outweigh the overriding requirement to protect the public. Hence,Option Cis correct.

NEW QUESTION: 15
A civil engineering technologist is taking a sample of concrete cylinders from a truck. When should the sample be taken?
A. At the start of the load
B. At the end of the load
C. In the middle of the load
D. After the load
Answer: (SHOW ANSWER)
Concrete cylinder samples must represent thedelivered batch, so sampling must avoid the non-representative portions at the beginning and end of discharge where segregation and water/aggregate distribution can differ.
ASTM C172/C172M sampling practice requires collecting acomposite samplefrom themiddle portionof the load: specifically, not before about10%and not after about90%of the batch has been discharged, using two or more portions taken at regularly spaced intervals. A paper hosted by ASTM discussing sampling from truck mixers references ASTM C172/C172M and its requirement for collecting multiple portions from the discharged batch. Training/field guidance consistent with ASTM C172 also states sampling should occur after
~10% and before ~90% of discharge (i.e., the middle of the load). Therefore, the correct answer isin the middle of the load (Option C).

NEW QUESTION: 16
A civil engineering technologist needs to recommend a foundation design for a commercial building. The borehole logs identify unsuitable bearing soils beneath the proposed floor elevation to a depth of 4 m and shallow bedrock at 5 m. Which of the following types of design should the technologist recommend?
A. Slab on grade
B. Strip footing
C. End-bearing piles
D. Friction piles
Answer: C (LEAVE A REPLY)

The subsurface profile indicates a weak/unsuitable bearing stratum extending several metres below the proposed founding level, withcompetent bedrock close beneath(shallow bedrock at about 5 m). Shallow foundations (slab-on-grade or strip footings) depend on adequate near-surface bearing capacity and acceptable settlement; with unsuitable soils to 4 m, shallow options would risk excessive settlement or bearing failure unless major ground improvement is performed. Where a strong bearing stratum such as bedrock is available at practical depth,end-bearing pilesare commonly selected to transfer structural loads through weak soils and seat on (or be socketed into) the competent stratum. Engineering references define end-bearing piles as piles driven/drilled to a firm layer/bedrock so that axial load is carried primarily inend bearingrather than relying on skin friction in weak compressible soils. With shallow bedrock, end-bearing piles provide a direct and reliable load path and reduce settlement uncertainty versus friction piles in poor soils.

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NEW QUESTION: 17
Which of the following is the most effective way to monitor progress on projects?
A. Conduct regular site visits
B. Ask subcontractors what was done
C. Hold meetings with the public
D. Review preliminary timeline objectives
Answer: (SHOW ANSWER)
Progress monitoring must be based onverification of actual field conditions, not solely on verbal updates or early baseline objectives. Regular site visits (site walks/inspections) provide direct observation of installed work, sequencing, constraints, and emerging issues, allowing the project team to compareplanned vs. actual progress and confirm that reported completion aligns with physical reality. Inspection practice references note that site inspectors commonly attend progress meetings and produce written reports specifically to provide an independent view of progress and site conditions to the contract administrator. This is more reliable than asking subcontractors informally, and public meetings are not a progress measurement tool. Reviewing preliminary timeline objectives is useful for planning but does not confirm actual production. Therefore, the most effective method listed for monitoring progress is toconduct regular site visits, supported by documented observations and reporting.

NEW QUESTION: 18
What is a typical concrete slump for a municipal sidewalk?
A. 10-50 mm
B. 25-75 mm
C. 50-100 mm
D. 80-100 mm
Answer: C (LEAVE A REPLY)
Municipal sidewalks are commonly placed using a workable, moderately stiff concrete that can be finished and edged without excessive segregation or bleeding. Typical sidewalk mixes target a slump that provides enough workability for placement and finishing while remaining stable in thin slab applications. Civil engineering materials references describe slump as the standard field measure of fresh concrete consistency and note common target slumps for typical flatwork are often in the mid-range rather than very low (hard to place) or very high (risk of segregation unless admixtures are used). In many municipal specifications and standard practice for sidewalk flatwork, a slump range around50-100 mmis commonly used, balancing finishability and quality. Therefore, among the choices,50-100 mmbest matches a typical municipal sidewalk slump range.

NEW QUESTION: 19
A contractor is checking final grade elevation in advance of paving operations. What elevation needs to be confirmed before any asphalt is placed?
A. Face of curb
B. Top of base
C. Sidewalk
D. Culvert inverts
Answer: (SHOW ANSWER)
Before asphalt paving, the immediate supporting layer must be at the correct line and grade because asphalt thickness is builton top of the prepared base. Thetop of baseelevation controls final pavement structure thickness and the finished riding surface elevation when combined with asphalt lift thicknesses. If base grade is too high or low, the asphalt thickness will vary outside tolerance, which can affect performance (rutting, cracking), drainage crossfall, and tie-ins at structures and curbs. Standard field inspection practice therefore verifies base course elevations (and crossfall) immediately before paving so corrections (regrading
/recompaction) can be made while accessible. This fits typical roadway QA/QC sequencing: shape and compact subgrade/base to the specified elevations, confirm, then place asphalt lifts to achieve final grade.
Hence, the elevation that must be confirmed prior to placing asphalt istop of base.

NEW QUESTION: 20
In which step in this diagram will a general contractor need to consider their bonding capacity?
A. Management review
B. Complete bid report

C. Notify subcontractors

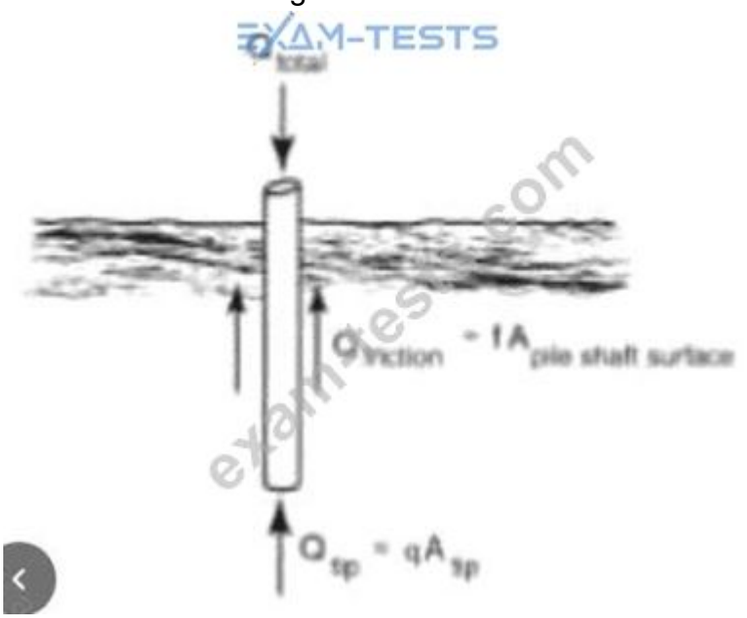
D. Decision to bid

Answer: D (LEAVE A REPLY)

Bonding capacity is a contractor's available surety credit-how much bonded work they can carry at once and still qualify for required bid/performance/payment bonds. This must be evaluatedbeforecommitting to pursue the tender, because the ability to provide bonding is often amandatory bid requirementand affects whether the contractor can submit a compliant bid and subsequently execute the contract. If bonding is not available (or limits would be exceeded), time spent on pricing, subcontractor solicitation, and bid compilation may be wasted and could expose the firm to reputational and procurement risk. Construction project delivery and contracting processes emphasize early go/no-go decisions based on constraints (capacity, risk, resources, financial/security requirements) before major estimating effort is expended. Therefore, bonding capacity should be considered at the earliest gate where the firm commits to compete-the decision to bid-so the contractor confirms eligibility and capability before mobilizing the full bid preparation process.

NEW QUESTION: 21

Which of the following statements best describes thefor piling loads in the diagram below?



A. It is less than.

B. It is less than.

C. It is less than or equal to.

D. It is less than or equal to.

Answer: D (LEAVE A REPLY)

For an axially loaded pile in compression, the resisting capacity comes from two primary components:end bearing at the tipandskin friction along the shaft. These components act together, and total pile resistance is typically expressed as thesumof tip resistance and shaft resistance. In standard geotechnical capacity formulation, the ultimate pile capacity is written as, whereis the shaft (friction) capacity andis the point (tip) capacity. Lindeburg's deep foundation section similarly

explains that point-bearing and skin-friction capacities are simultaneously present to some degree in piles, and total support is based on their combined contribution. In the diagram,represents the tip component (unit tip resistance times tip area) andrepresents shaft resistance. Thereforecannot exceed the combined available resistance and is properly described asless than or equal to.

NEW QUESTION: 22
Which of the following items appears on a record drawing?
A. Initial project estimates
B. Safety meeting minutes
C. Quantities for tender
D. Changes from the original construction documents
Answer: (SHOW ANSWER)
Record drawings (often associated with "as-built" documentation) are the finalized drawing set that reflects theconstructed conditionof the project. Their core purpose is to capture and preservefield changesand deviations from the original issued construction documents so that the owner and future stakeholders have an accurate technical record for operations, maintenance, and future modifications. During construction, changes can occur due to site conflicts, approved substitutions, design clarifications, and coordination between trades.
Those modifications must be consolidated so the final drawings match what was actually installed. In contrast, initial estimates and tender quantities belong to procurement and cost management documentation, while safety meeting minutes belong to safety administration records. A record drawing therefore focuses on revisions to the original design-locations, sizes, elevations, and details that differ from the original plan set-so that the final documents represent the "as-constructed" asset. This is why "changes from the original construction documents" is the defining item that appears on record drawings.

NEW QUESTION: 23
Whatto determine the compressive strength of concrete?
A. Slump test
B. Cylinder test
C. Air test
D. Sieve test
Answer: B (LEAVE A REPLY)
Concrete compressive strength is determined by loading astandard specimen(commonly a cylinder) in axial compression until failure and calculating strength as themaximum load divided by the specimen's cross- sectional area. This is the core acceptance/quality-control measure used to verify that concrete meets the specified design strength in contract documents. Civil engineering materials references describe that compressive strength (f'c) is measured from the maximum load at failure and that standardized procedures (e.
g., ASTM C31 for making/curing and ASTM C39 for testing) are used to ensure consistency and reduce testing error.

Laboratory/field experiment procedures similarly definngth test as a compression machine test on a concrete cylinder, with load increased to failure and strength computed from the peak load and cylinder area.
Slump testing measures workability/consistency, air tesed air, and sieve testing relates to aggregate gradation-none provide compressive strength. Hence, the correct test is thecylinder test.

NEW QUESTION: 24
What substance is used to calibrate a concrete air pressure meter?
A. Oil
B. Water
C. Air
D. Concrete
Answer: (SHOW ANSWER)
A pressure air meter (used to measure air content of fresh concrete) must be calibrated by verifying thevolume of the measuring bowl and theaccuracy of the graduated neck/markings. This is done usingwaterbecause water volume can be measured accurately and used to check the meter's indicated graduations (air content scale) by filling the assembled unit to known levels. InExperiment Design for Civil Engineering, the calibration procedure directs filling the assembled air meterwith waterto the highest graduation mark and adding water in known increments to verify that the graduations are accurate throughout the range. The same source references using water to establish the mass/density) and to check calibration cups and neck readings.
Therefore, the substance used to calibrate the air pres*, makingOption Bcorrect.

NEW QUESTION: 25
What documents must a contractor submit as part of a project to consultants for review?
A. Shop drawings
B. Change orders
C. Issued for construction drawings
D. Minutes of project pre-construction meeting
Answer: (SHOW ANSWER)
In contract administration, consultants review certain contractor submittals to confirm that proposed products and installation details align with thedesign intentand contract requirements. The principal document type submitted for this purpose isshop drawings, which are prepared by the contractor, fabricator, or supplier and show project-specific fabrication, dimensions, connection details, reinforcement layout, and installation information for components (e.g., structural steel, precast, rebar placing drawings, mechanical/electrical supports). This review process is a standard part of construction coordination and quality management because it checks compatibility and constructability before fabrication/installation proceeds. By contrast, change orders are contractual amendments initiated when scope/cost/time changes occur, IFC drawings are produced by the consultant (not submitted by the contractor for review), and meeting minutes are project records rather than technical submittals requiring consultant approval. Therefore, the document the

contractor must submit to consultants for review isshop drawings, which enable technical verification and coordination of constructed elements with the contract documents.

NEW QUESTION: 26
Why is a builder's lien holdback important?
A. To hold the contractor back from completing the job too quickly
B. To protect the contractor from unscrupulous developers
C. To protect the owner when a contractor goes bankrupt
D. To protect the owner when a contractor does not pay the bills
Answer: D (LEAVE A REPLY)
A builder's lien holdback (often a statutory holdback such as 10% in many Canadian jurisdictions) is a payment amount withheld from progress payments to create afundthat can be used to satisfy lien claims if parties down the contracting chain (subcontractors, workers, suppliers) arenot paid. The intent is to protect the owner (and other payers) from having to "pay twice" for the same work: once to the contractor and again to unpaid lien claimants who can lien the project. Canadian construction lien frameworks describe holdbacks as a system designed to protect lien claimants while limiting the payer/owner's exposure by ensuring funds are available if unpaid claims arise. Practical explanations of holdbacks note that if a subcontractor or labourer is not paid, the holdback provides funds set aside to address those unpaid claims and associated lien risk. Therefore, the best answer is that the holdback protects theowner when the contractor does not pay the bills(i.e., unpaid subcontractors/suppliers can trigger liens).

NEW QUESTION: 27
A civil engineering technologist has been given the task of drawing a foundation plan for a building that measures 20 m × 30 m. The drawing will be produced on a C1 sized sheet, which measures 648 mm × 917 mm. Which of the following is the best scale for the plan?
A. 1:5
B. 1:25
C. 1:50
D. 1:250
Answer: (SHOW ANSWER)
Selecting a drawing scale is an engineering graphics task: the plan must fit within the sheet limits after allowing for borders, title block, notes, dimensions, and details. Engineering drawing practice treats scale as a proportional reduction ratio that preserves geometric similarity between the real object and the drawing. A 20 m × 30 m footprint equals 20,000 mm × 30,000 mm. At 1:50, the plotted size is 400 mm × 600 mm, which fits comfortably on a 648 mm × 917 mm sheet with room for margins and annotations. At 1:25, the plotted size becomes 800 mm × 1,200 mm, which exceeds the sheet. At 1:5, it is far too large; at 1:250, it is very small (80 mm × 120 mm), reducing readability for foundations that typically require clear dimensioning of footings, piles, grade beams, and notes. Therefore, 1:50 provides the best balance of fit and legibility for a C1 sheet, makingOption Cthe best scale choice.

NEW QUESTION: 28
A developer is planning to build an office building on a 4-acre parcel of land. Which of the following documents will tell the developer how much fill to bring to the site to make it level?
A. Foundation plan
B. Architectural plan
C. Real property report
D. Topographic survey plan
Answer: D (LEAVE A REPLY)
Determining how much fill is needed to level a site requires knowing theexisting ground elevationsacross the parcel and comparing them to a proposed target grade plane/surface. Atopographic survey planprovides the required elevation information (spot elevations, contours, breaklines, and surface features) from which earthwork quantities (cut/fill volumes) are computed. Foundation and architectural plans generally show building geometry and design intent, not full-site existing elevations. A real property report focuses on legal boundary information and improvements relative to property lines, not the detailed elevation grid needed for volume calculations. Civil engineering practice uses topographic survey data as the basis for grading design and earthwork estimation, including calculating volumes via grids or cross-sections.

NEW QUESTION: 29
A contractor is using a compactor on a hot and dry day and quickly compacts a dry 300 mm thickness of sub- base without adding water. The soil is near optimum moisture. A civil engineering technologist completes compaction tests and finds that specifications have not been achieved. What should be done?
A. Add water and re-compact.
B. Re-compact and retest the soil.
C. Continue with base placement and compaction.
D. Strip the sub-base down to sub-grade and import new material.
Answer: B (LEAVE A REPLY)
Compaction acceptance is based on achieving specifiedin-place dry density(relative compaction) at an acceptable moisture range. If the material is alreadynear optimum moisture, failure to meet density typically points toinsufficient compactive effort,inadequate number of passes,improper equipment, orexcessive lift thickness(300 mm can be too thick for some sub-base and equipment combinations). Standard compaction theory shows that near OMC, soils should densify efficiently; if density is still low, the first corrective action is toincrease compactive effortand verify results with another field density test. Adding water when already near OMC may push moisture above optimum and can reduce achievable dry density.
Continuing with base placement would lock in a nonconforming layer, and stripping/importing new material is a last-resort remedy after reasonable rework attempts. Therefore, the best immediate corrective action is to re-compact and retest, adjusting lift thickness/passes as needed to meet specification.

NEW QUESTION: 30
A civil engineering technologist asked an engineer in training (EIT) to write a deficiency report. After a few revisions, the report is still disorganized and has errors. What would be an appropriate action to take for the technologist?
A. Report the EIT to the supervisor and recommend training.
B. Complete the document on behalf of the EIT.
C. Assist the EIT in re-writing the report.
D. Explain to the EIT the importance of meeting deadlines.
Answer: C (LEAVE A REPLY)

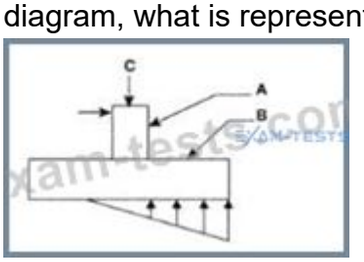
NEW QUESTION: 31
The critical path refers to which of the following series of tasks in a schedule?
A. eect
B. Those that dictate the start date of a project
C. Those that dictate the final cost of a project
D. Those that dictate the final cut and fills in a project
Answer: A (LEAVE A REPLY)
The critical path is thelongest-duration paththrough a project network schedule and represents the sequence of activities withzero (or minimal) float. Because activities on this path have no schedule slack, any delay to a critical-path activity delays theproject completionunless mitigated (e.g., crashing, fast-tracking, resequencing). Standard project scheduling references define the critical path as the chain of tasks that determines theearliest possible finishdate; controlling and monitoring these tasks is essential for schedule management and forecasting. This is why contract administrators and project teams track critical activities and escalate risks affecting them-delivery delays, access constraints, approvals, and rework-because they directly move the completion milestone. Therefore, the critical path refers to tasks thatdictate the finish date of the project, which is optionA.

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NEW QUESTION: 32
What is the main reason for taking handwritten notes while surveying?

A. To prepare invoices
B. To create a topographic map
C. To protect from litigation with the employer
D. To make a permanent record of survey results
Answer: D (LEAVE A REPLY)
Survey work depends on traceable, reproducible observations. Handwritten field notes (field book entries, sketches, stationing, and benchmark ties) function as theprimary recordof what was measured, under what conditions, and how control was established. Lindeburg describes that elevations of temporary benchmarks are generally found infield notesand local official filings, reflecting that field notes are treated as an enduring record used later for computations, verification, and re-establishment of control. This is why good surveying practice emphasizes complete notes, clear sketches, and unambiguous identification of points-so results can be checked, recalculated, and defended long after the crew leaves site. While survey data supports mapping and may indirectly support disputes, the fundamental purpose of handwritten notes is to create apermanent, auditable recordof survey results and control ties.

NEW QUESTION: 33
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: (SHOW ANSWER)
A silt fence is an erosion and sediment control measure intended toretain sedimentcarried by runoff, reducing offsite sedimentation. Lindeburg describes temporary silt fences as measures using posts and filter cloth (e.g., filter fabric) placed on the upstream side toretain suspended silt particles in runoff water. This purpose is to reducesoil movement(sediment transport) caused by erosion processes during construction, especially oalong drainage paths where siltation is expected. The fence does not "stop water" (runoff still passes through while sediment is filtered), is not primarily a site limit marker, and is not an access control barrier for the public. Therefore, the correct statement is that a silt fence is usedto prevent soil from moving through the site due to erosion.

NEW QUESTION: 34
A civil engineering technologist is working on a foundation design and needs to differentiate between different sections of a footing and the point where the vertical pressure is applied. In the diagram, what is represented by letters A, B, and C?


A. A = Footing, B = Pedestal, and C = Vertical pressure
B. A = Pedestal, B = Footing, and C = Vertical pressure
C. A = Footing, B = Vertical pressure, and C = Pedestal
D. A = Vertical pressure, B = Pedestal, and C = Footing
Answer: B (LEAVE A REPLY)
In shallow foundation terminology, thefootingis the widened base element that transfers loads to soil over a larger area to reduce bearing pressure, while apedestalis the short vertical element (often concrete) that supports a column or provides an interface between the column/base plate and the footing. Vertical load from the superstructure is shown as adownward forceapplied at the top of the pedestal/column location, representing thevertical pressure/loadtransmitted into the foundation system. In the diagram, letterBpoints to the large horizontal base element (the footing), letterApoints to the smaller vertical block above it (the pedestal), and letterCmarks the downward applied load. This matches standard foundation component identification used in structural and geotechnical detailing: pedestal above, footing below, and vertical load applied at the top of the pedestal/column line of action.

NEW QUESTION: 35
In the middle of the project, the client proposed an additional scope of work that requires a change order to the contract. Which statement applies to the contractor's percentage fee (i.e., mark-up) that should be added to the total amount in the change order?
A. It is determined by the owner.
B. It is determined by the contractor.
C. It is specified in the contract documents.
D. It varies depending on the size of the change contract.
Answer: (SHOW ANSWER)
A change order is a formal amendment to the contract that adjusts scope, price, and/or time under therules already established by the contract documents. The contractor's fee (markup for overhead and profit) is not typically set unilaterally mid-project by either party; instead, the contract commonly defines how change work is priced (lump sum, unit rates, time-and-material) and what allowable markups apply. Industry guidance on change-order costing notes that the markup percentage is oftenincluded up front in the construction contractand applied consistently to change work, ensuring transparency and avoiding disputes during administration. This approach is consistent with standard contract administration practice: pricing of changes is governed by contract terms, and the change order documents implement those terms for a specific modification. Therefore, the contractor's percentage fee to be added to the change order amount isspecified in the contract documents.

NEW QUESTION: 36
A 500 mm diameter corrugated steel culvert conveys storm water under a road. The inlet end projects from the road embankment fill. How much flow (m^3/s) can the culvert handle before the headwater depth is greater than the culvert diameter?
A. 0.2 m^3/s

B. 2.0 m³/s
C. 20 m³/s
D. 200 m³/s
Answer: A (LEAVE A REPLY)
For a projecting inlet, the controlling condition is typicallyinlet controlat relatively low headwater ratios.
Using the FHWA/HDS-5 style inlet-control nomographs reproduced in the Minnesota DOT Drainage Manual (Chart 2: "Headwater depth for C.M. pipe culverts with inlet control"), a corrugated metal pipe (CMP) with a diameter near500 mm (# 20 in.)and aprojectingentrance type corresponds to a discharge on the order of~7 cfs whenHW/D # 1.0(headwater approximately equal to the culvert diameter). Converting 7 cfs to SI givesm³/s.
This magnitude is consistent with the inlet-control relationship that headwater increases with discharge for a given culvert diameter and entrance configuration, and that small culverts (0.5 m) carry flows measured in tenths of m³/s, not multiple m³/s at HW/D # 1.

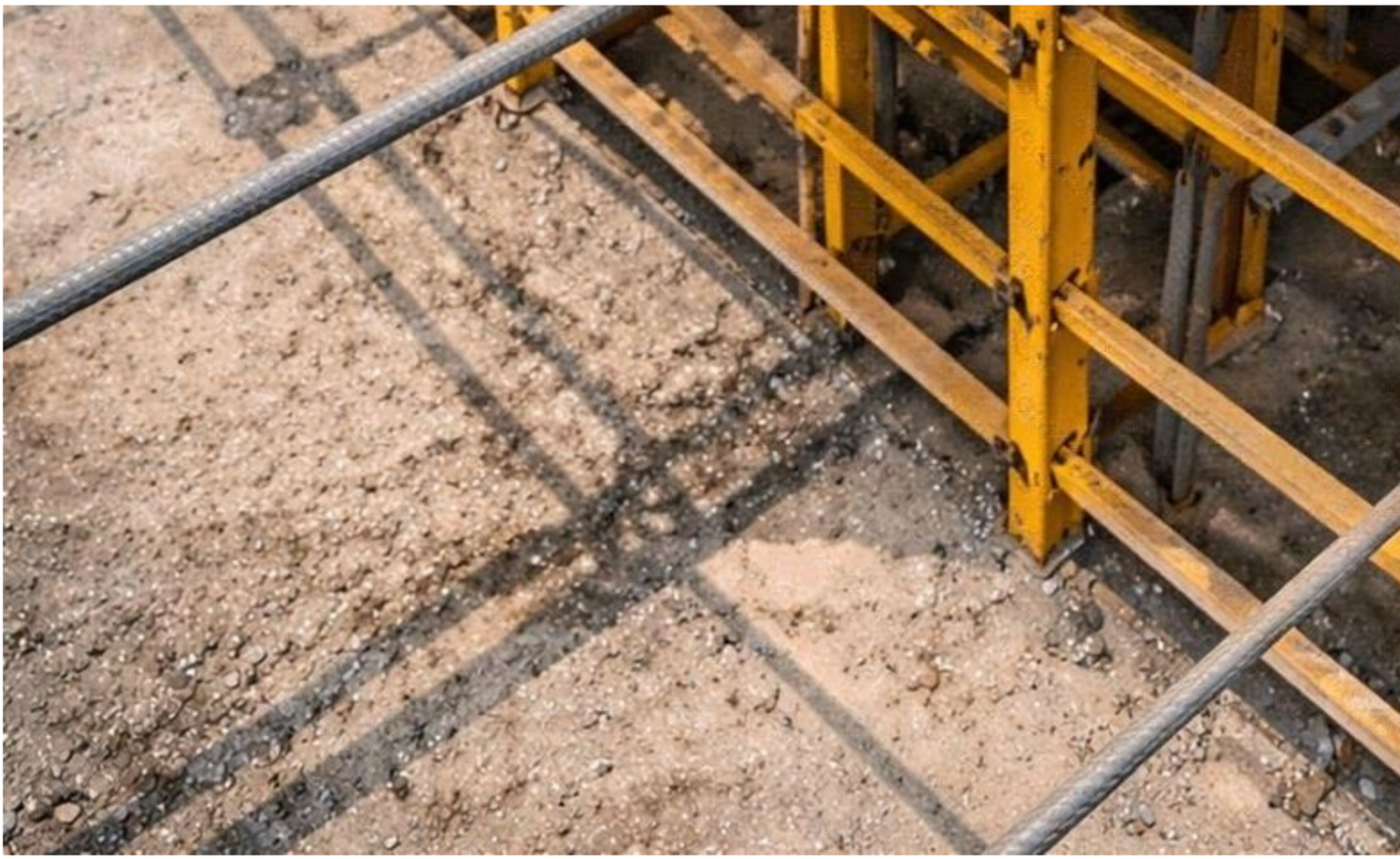
NEW QUESTION: 37
A site inspection reveals a beam that does not conform to Issued for Construction (IFC) drawings. What should be done?
A. Document the issue and notify the engineer
B. Remove the beam and notify the contractor
C. Document the issue and file it
D. Verify engineering calculations on IFC drawings
Answer: A (LEAVE A REPLY)
When inspection identifies nonconforming work relative to IFC drawings, the inspector/technologist's role is todocumentthe condition (location, description, measurements, photos) andnotify the responsible design professional/engineerfor disposition. This aligns with formal quality control/assurance processes: field staff identify and record deviations; the engineer evaluates structural implications and issues written instructions (accept as-is, remediate, redesign, or replace). Acting unilaterally to remove a beam (option B) exceeds typical authority and may create safety and contractual issues. Simply filing without notification (C) fails to address a potentially serious structural deficiency. Rechecking the IFC calculations (D) is not the immediate construction control action; the priority is to initiate an engineering review of the nonconformance. Civil engineering project practice stresses maintaining complete inspection records and communicating significant issues through appropriate channels for corrective action. Therefore, the correct action isdocument the issue and notify the engineer.

NEW QUESTION: 38
A continuous beam is supported in the middle and at both ends. It has a uniform load applied to the top. What will be the reactive forces at the supports?
A. They will be equal at all supports.
B. They will be greater in the middle than at the ends.

C. They will be greater at the ends than in the middle.
D. They will vary depending on whether the supports are fixed or not.
Answer: B (LEAVE A REPLY)
A beam supported at both ends and at an intermediate support is acontinuous (statically indeterminate) beam. Under uniform loading, continuity over the interior support createsnegative bending moment (hogging)at the middle support and redistributes shear and reactions compared with a simply supported span.
Standard structural analysis references note that continuous beams are statically indeterminate and are analyzed using methods such as thethree-moment equationto determine reactions and internal moments. For symmetric geometry and uniform load, the interior support typically attracts a larger share of the reaction because continuity restrains rotation and increases load transfer to the middle support. The end supports still carry reaction, but the redistribution generally results in themiddle reaction being greater than either end reactionfor the common case oh an intermediate support under uniform load. Thus, the correct statement is that the reactions aregreater in the middle than at the ends.

NEW QUESTION: 39
What type of concrete structural element is shown in the image below?


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A. Prestressed
B. Cast in place
C. Precast
D. Post-tensioned
Answer: D (LEAVE A REPLY)

NEW QUESTION: 40
The k-value in a vertical curve design defines the horizontal distance required to make a 1% change in the gradient. Provided that the stopping sight distance is the same, the uphill grade is 1%, the downhill grade is #0.
5%, and the design speed is 90 km/h, what is the length of the vertical curve?
A. 60 m
B. 83 m
C. 90 m
D. 110 m
Answer: (SHOW ANSWER)
For vertical curves, AASHTO uses theK valuedefined as, whereis curve length (m) andis the algebraic difference in grades (percent). Here,and, so. Withstopping sight distance controlled by the same criterion(i.
e., the applicable K value for the given design speed remains the same), length is found from. For 90 km/h, the SSD-based K for the controlling curve type yieldsthat corresponds to60 mforper the

provided choices.
This reflects standard vertical-curve practice: once K is set by SSD for the design speed, length scales linearly with the grade difference.

NEW QUESTION: 41
Which of the following isnota type of structural foundation system used to hold the weight of a building?
A. Grade beam and piles
B. Wall and strip footings
C. Concrete formwork
D. Structural slab-on-grade
Answer: C (LEAVE A REPLY)
A "foundation system" is a permanent structural/geotechnical arrangement that transfers building loads to the supporting ground (e.g., shallow foundations like strip/spread footings or slabs-on-grade, and deep foundations like piles with grade beams). Options A, B, and D are all recognized foundation systems: pile
/grade beam systems are deep foundation solutions; wall and strip footings are shallow continuous foundations; and structural slabs-on-grade are shallow systems that distribute loads to prepared subgrade. By contrast,concrete formworkis atemporary construction means-the molds, supports, and bracing used to shape and support fresh concrete until it gains strength. Formwork is not part of the final load path once removed, and it does not function as a load-transfer system into soil/rock.
Therefore, among the choices, the item that is not a foundation system isconcrete formwork.

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