

The following checklists are designed to assist quality assurance (QA) inspectors in performing inspections of construction of NRCS projects. The checklists may not include every item that must be inspected to verify compliance with the applicable contract requirements. Checklists should be completed as the work progresses or at milestones during the contract performance period. Maintain completed checklists at the jobsite with the inspection records, and submit them to the contracting officer's representative (COR)/government representative (GR) along with the job diary after work is completed. Document in the job diary when each checklist is completed.

Each checklist is designated NEH 645 CL #.#. The first number corresponds to the NEH 645 chapter to which the checklist is directly associated. The second number corresponds to the number of the checklist(s).

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NEH 645 CL 3.1 Quality Assurance Inspection Checklist

This checklist is intended to be a guide for an NRCS QA inspector in preparation for and in performance of the inspection of construction of NRCS projects. It may not address all items required of the QA inspector, and some parts of the checklist may not be applicable to a particular project.

Project Name: _____ Project No: _____

Location: _____ Date: _____

Field Inspector: _____

Work Inspected: _____

No.	Task	Completed		
		Yes	No	NA
	Prior to contract award			
1	Review appointment letter and fully understand responsibilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Review QA plan and prepare equipment and supplies needed to conduct tests and inspect work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Review the contract and seek clarification from COR/GR for items not completely understood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Begin the job diary at the initial site showing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Mark changes on field copies of bid schedule, drawings, and specifications as per contract addendum or amendment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Obtain current copy of reference standards needed to perform inspection duties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Prior to beginning construction			
7	Make diary entry at the preconstruction conference.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Photograph pre-work site conditions such as ingress/egress road and all structures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Verify existence of an approved safety officer and safety plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Review safety checklist with contractor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	See that the contractor conducts a safety meeting prior to the start of work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Verify at least one person from each foreman's work crew has a current first-aid card.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Verify that all postings required by the contract (EEO posters, emergency contact information, NPDES permit notice, etc.) are maintained and are legible and visible to all contractor personnel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Verify all known cultural resources and properties of historical significance are identified and protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Task	Completed		
		Yes	No	NA
15	Verify SWPPP will be implemented at beginning of work and other NPDES requirements are addressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Verify sanitation facilities are operational.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Verify the specified hard hat sign is prominently displayed at site entrances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Verify utilities and existing works are identified and protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Verify utility owners are notified as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Verify contractor has a notice-to-proceed prior to beginning any work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During construction				
21	Recognize and immediately report, to the COR/GR, potential cultural resources and properties that may be of historical significance whenever such resources or properties will be disturbed by construction activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Verify and document that all erosion and pollution control requirements are carried out in accordance with contract requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Verify and document that all safety and sanitary requirements are maintained in accordance with the contract.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Verify and document that the contractor has done everything possible to identify and protect all utilities that exist in the general work area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Schedule government/owner performed surveys with COR/GR to ensure that contractor's production is not impeded by lack of surveys.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Determine that satisfactory material samples and certifications have been furnished and materials are approved by COR/GR before incorporated into the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Perform tests to verify the adequacy of the contractor's quality control system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	See that the work is performed in accordance with the terms and conditions of the contract.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Maintain a field copy of drawings and specifications showing all changes (as-built plans).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Notify the contractor if work does not meet contract requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	Notify the COR/GR if unsatisfactory work is not immediately corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Document noncompliance and all related correspondence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	Verify contractor compliance with minimum wage rate requirements where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	Maintain an accurate and complete chronological record of the project in the job diary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	Support the job diary with photographic documentation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	Keep track of work accomplished, review contractor's invoices, and inform COR/GR of discrepancies between record of work accomplished and invoices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	Where allowed and when authorized, issue suspend and resume work orders on behalf of the CO.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	Immediately report disputes, differing site conditions, and unusual occurrences to the COR/GR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Task	Completed		
		Yes	No	NA
39	On Federal contracts, if delegated authority by the CO, suspend the contractor's right to proceed if there is imminent danger to the health or safety of the public or government personnel; if not delegated authority, notify COR/GR immediately.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	Elevate questions, issues, and concerns to the COR/GR whenever an answer is unknown or disputes cannot be resolved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41	Schedule check-prior-to-final inspection with COR/GR and prepare a list of items remaining to be accomplished to be reviewed during the inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42	When final surveys are the responsibility of the government/owner, schedule final surveys to document completion of work and provide data for as-built plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43	Verify that all items listed during the check-prior-to-final inspection are completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44	Verify that all temporary erosion control measures are removed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45	Schedule the final inspection with COR/GR and prepare a list of items remaining to be accomplished to be reviewed during the inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46	Ensure that all remaining items are completed prior to contractor demobilization.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47	Oversee and document contractor demobilization.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48	Complete and submit field copy of as-built plans to the COR/GR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49	Ensure that all photo documentation is submitted to the COR/GR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50	Submit all job diaries to the COR/GR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

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NEH 645 CL 4.1 Construction Safety Checklist

This checklist is intended to be used as a guide for periodically assessing safety on construction projects. Its use is optional. It may not address all potential hazards that could exist, and some parts of this checklist may not be applicable to a particular project. Results of safety assessments should be shared with the contractor's supervisory personnel.

Project Name: _____ Project No: _____

Location: _____ Date: _____

Work period: _____ A.M./P.M. to _____ A.M./P.M.

Field Inspector: _____

Work Inspected: _____

Fill out sections I and II at start of project. Complete sections I and II again only when a factor has changed.

I. General requirements

Written safety program received (date): _____

Preconstruction safety meeting held (date): _____

Safety supervisor: _____ Alternate: _____

Scheduled weekly safety (tailgate) meeting (day/time): _____

No.	Inspection item	Yes	No	NA
1	Contractor requires subcontractors to comply with all safety requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Communications and transportation facilities available at jobsite to handle injury situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	New employees given safety instructions for their jobs and the jobsite.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

II. Contractor's employees with first aid training certification (Red Cross, Bureau of Mines, or equivalent):

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

III. Technical requirements

No.	Inspection item	Yes	No	NA
1. Medical services and first aid				
1.1	Phone numbers of offsite medical attention and ambulance service posted outside first aid facility and all jobsite offices. (OSHA 1926.50(f) and NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Locations of first aid kits and other medical supplies posted conspicuously on signs outside first aid facility and all jobsite offices. (NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Complete first aid kits available, compliant with ANSI Z308.1–1998 Type III. Minimum of 1 kit per 25 employees. (OSHA 1926.50(d)(1) and (2) and NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Employee with a valid certificate in first aid is assigned during each work shift. (OSHA 1926.50(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	At least one stretcher and two blankets available at jobsite.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Sanitation				
2.1	Potable water supply available at jobsite. (OSHA 1926.51(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Potable water dispensers clearly marked; each equipped with tight cover and tap. (OSHA 1926.51(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	No common drinking cups. (OSHA 1926.51(a)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Waste receptacles available for disposable cups and other litter, if single service cups are supplied. (OSHA 1926.51(a)(5))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Electrolyte supplements available as needed. (NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Adequate toilets provided at jobsite. Number of toilets and urinals required are listed in OSHA 1926.51(c), table D–1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Head protection				
3.1	Hard hats worn by all persons entering any part of jobsite. (NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Hard hat area signs, 3- by 4-foot minimum size, erected at all jobsite access locations. (NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Noise exposure				
4.1	Ear protection devices worn when noise exceeds allowable exposure. (OSHA 1926.101)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Illumination				
5.1	Worksites, offices, shops, and storage areas lighted as required. (OSHA 1926.56)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Eye and face protection				
6.1	Eye and face protection provided for hazardous jobs. (OSHA 1926.102)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Goggles or other protective equipment kept clean and in good repair. (OSHA 1926.102(a)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
7. Respiratory protection				
7.1	Respirators are worn when dust concentrations exceed safe hygienic levels. (OSHA 1910.134)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Employees protected from other hazardous concentrations. (OSHA 1910.134)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Respirators kept clean and in good condition. Respirators inspected regularly. (OSHA 1910.134)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fall protection (OSHA 1926 Subpart M)				
8.1	Employees protected by safety belts and lines when working on steep slopes or unguarded heights. (NRCS OSHA Supplement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Employees working on surfaces 6 feet or higher with an unprotected side or edge are protected from falling. (OSHA 1926.501(b)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Working over or near water				
9.1	U.S. Coast Guard-approved life jackets or vests worn by employees if there is danger of drowning. (OSHA 1926.106(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Protective equipment inspected for defects that would alter the buoyancy and strength. (OSHA 1926.106(b))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	Ring buoys and 90-foot lifelines readily available for rescue operations. (OSHA 1926.106(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Fire protection				
10.1	Fire extinguisher with 10B rating required within 50 feet when more than 5 gallons of combustible liquid are used. (OSHA 1926.150(c)(1)(vi))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Portable extinguishers serviced and maintained. (OSHA 1926.150(c)(1)(viii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	Fire extinguishers have been listed or approved by a nationally recognized testing laboratory. (OSHA 1926.150(c)(1)(ix))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Fire prevention				
11.1	Combustion engine exhaust kept clear of combustible materials. (OSHA 1926.151(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2	Signs posted at and around operations having fire hazards, "NO SMOKING OR OPEN FLAME." (OSHA 1926.151(a)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3	Storage area kept free of weeds, grass, and other combustible materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4	Materials stored indoors are handled and piled in ways that minimize fire hazard. (OSHA 1926.151(d)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Flammable and combustible liquids				
12.1	Metal safety cans (smaller than 5-gal capacity) used to store or handle flammable liquids. (OSHA 1926.152(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2	Storage of flammable liquids in open room or trailer limited to 25 gallons.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3	Storage of liquids in any one cabinet limited to 60 gallons flammable and 120 gallons combustible. (OSHA 1926.152(b)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.4	Cabinet containing such liquids labeled conspicuously, "FLAMMABLE—KEEP FIRE AWAY." (OSHA 1926.152(b)(2)(iii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.5	Outdoor portable storage tanks positioned at least 20 feet away from any building. (OSHA 1926.152(c)(4)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.6	Portable storage tanks equipped with vents. (OSHA 1926.152(i)(2)(iv)(A))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.7	Containers, tanks, and hoses interconnected (bonded) electrically when transferring liquids. (OSHA 1926.152(e)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
12. Flammable and combustible liquids—continued				
12.8	Dispensing devices and nozzles for flammable liquids shall be of an approved type. (OSHA 1926.152(e)(5))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.9	Flammable liquids kept in closed containers when stored. (OSHA 1926.152(f)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.10	Portable fire extinguishers with 20 BC rating required within 75 feet of refueling truck or station. (OSHA 1926.152(g)(11))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.11	Motors of all equipment shut off during refueling. (OSHA 1926.152(g)(10))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.12	Sign at refueling area posted conspicuously, "NO SMOKING OR OPEN FLAME WITHIN 50 FT." (OSHA 1926.152(g)(8))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Temporary heating devices				
13.1	Adequate fresh air provided to ensure personnel safety. (OSHA 1926.154(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.2	Solid noncombustible material used to support heating units. Material extends 2 feet beyond each side of heater. (OSHA 1926.154(b)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.3	Minimum 10-foot clearance provided in temporary job enclosures between heater and combustible coverings. (OSHA 1926.154(b)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.4	Oil-fired heaters equipped with safety oil stop for protection during possible flame out. (OSHA 1926.154(e)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Signs, signals, and barricades				
14.1	Barricades erected and legible traffic signs posted at hazardous locations. (OSHA 1926.200(b)(1)); (Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.2	Signs posted and barricades installed to prevent public access.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.3	Nighttime signs and barricades lighted or reflectorized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.4	Flaggers used when working conditions warrant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.5	Red flags or sign paddles 18-inches square used by flaggers to make hand signals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.6	Reflectorized safety vests or coats worn by flaggers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.7	Detour signs posted on streets and highways. Sign types and placement meet State and local regulations and codes. (OSHA 1926.200(g)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Material handling, storage, use, and disposal				
15.1	Storage areas kept approximately level, well arranged, and free of flammable materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.2	Construction material stacked, racked, or blocked to prevent movement. (OSHA 1926.250(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.3	Lifelines with safety belts used by workers entering hoppers or tanks. (OSHA 1926.250(b)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.4	Excess material not stored on scaffolds or runways. (OSHA 1926.250(b)(5))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.5	All nails removed from used lumber. (OSHA 1926.250(b)(8)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.6	Material to be handled by crane stored in area clear of overhead power lines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Rigging equipment for material handling				
16.1	Equipment inspected before use and during material handling. (OSHA 1926.251(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.2	Equipment is adequate to handle loads. (OSHA 1926.251(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.3	Tagged equipment (determined by the contractor to be defective) removed or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
17. Chains				
17.1	Steel alloy chains identified by size, grade, and capacity. (OSHA 1926.251(b)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.2	Hooks, rings, and other attachments not shop-made. Capacity of hooks, rings, and other attachments at least as great as chain capacity. (OSHA 1926.251(b)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.3	Hoisting hooks equipped with safety keepers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Wire rope				
18.1	Eye splices made with at least three full tucks. (OSHA 1926.251(c)(4)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.2	Protruding splice ends covered or blunted. (OSHA 1926.251(c)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.3	Hoisting or pulling liner made of one continuous rope with no knots or splices. (OSHA 1926.251(c)(4)(ii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.4	Wire rope replaced when 10% of strands are broken in any length that equals 8 diameters of the rope. (OSHA 1926.251(c)(4)(iv))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.5	U-bolt clips are correct size and spaced properly. (OSHA 1926.251(c)(4)(iv))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.6	U-section attached to dead-end rope. (OSHA 1926.251(c)(5)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Fiber rope				
19.1	Fiber rope rings meet requirements. (OSHA 1926.251(d)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.2	Repairs made with splices; knots prohibited. (OSHA 1926.251(d)(2)(v))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.3	Coding for manufacturer, type of material, and capacity of rating shown on synthetic webbing. (OSHA 1926.251(e)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.4	Shackles and hooks meet requirements. (OSHA 1926.251(f))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Waste material disposal				
20.1	Scrap lumber, waste, and rubbish removed as work progresses. (OSHA 1926.252(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.2	Solvent waste, oily rags, and flammable material stored in covered metal containers until removed from jobsite. (OSHA 1926.252(e))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Power and hand tools				
21.1	Power tools equipped with guards (as manufactured) over all exposed moving parts. (OSHA 1926.300(b)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.2	Handheld power tools equipped with pressure control switches. (OSHA 1926.300(d)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.3	Goggles and other protective equipment worn by workers as required. (OSHA 1926.300(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.4	Tools with mushroomed heads or defective handles prohibited. (OSHA 1926.301(c) and (d))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.5	Electric-powered tools double insulated or grounded with 3-wire conductors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Grinders				
22.1	Machines equipped with guards and tool rests. (OSHA 1926.303(b))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.2	Grinding wheels checked for cracks and defects. (OSHA 1926.303(c)(7))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.3	Grinder spindles operated at safe speeds.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Gas welding and cutting				
24.1	Gas cylinders meet U.S. Department of Transportation requirements. (49 CFR-178-C) and (OSHA 1926.350(c)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
24. Gas welding and cutting—continued				
24.2	Hose lines distinguished either by color (such as, fuel is red, oxygen is green) or by surface texture. Oxygen and fuel lines shall not be interchangeable (OSHA 1926.350(f)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.3	Cylinders placed upright when stored or in use, chained to prevent overturning, and capped tightly when not in use. (OSHA 1926.350(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.4	Cylinders kept upright when moved (tilt and roll on bottom edge) and anchored to pallet before hoisting. (OSHA 1926.350(a)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.5	Cylinders protected from excessive heat or cold and from electric currents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.6	Defective gauges, regulators, valves, and hoses repaired or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.7	Friction lighters used to ignite gas torches. Matches prohibited. (OSHA 1926.350(g)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.8	Welding and cutting done only by authorized operators.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.9	Goggles or shields worn by welders and helpers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Arc welding and cutting				
25.1	Handgrips and jaws insulated for maximum ground voltage. (OSHA 1926.351(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.2	Cables and connectors rubber covered. Splices not made within 10 feet of electrode holders. (OSHA 1926.351(b)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.3	Framer of welding units grounded with 3-wire conductors or with separate wires at source. (OSHA 1926.351(c)(5))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.4	Protective eye shields used by welders and helpers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.5	Other workers near arc protected by screens or goggles. (OSHA 1926.353(d)(1)(ii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.6	Precautions taken to prevent fires. Fire extinguisher is available. (OSHA 1926.352(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Electrical				
26.1	Hot circuits de-energized or equipped with guards before starting work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.2	Hot voltage circuits equipped with guards. Signs posted, "DANGER-HIGH VOLTAGE." (OSHA 1926.404(d)(2)(ii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Grounding and bonding				
27.1	Portable plug-in equipment double insulated or grounded with 3-wire conductors. (OSHA 1926.404(f)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.2	Metal parts and frames of fixed equipment grounded. (OSHA 1926.404(f)(3))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.3	Hand lamps equipped with handles. Guard attached to each handle. (OSHA 1926.405(j)(1)(iii)(B))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.4	Extension cords kept clear of walkways, sharp corners, and projections.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.5	Worn or frayed electric conductors not permitted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.6	Fuses or circuit breakers provided for overcurrent protection. (OSHA 1926.404(e)(1)(vi))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Ladders (OSHA 1926.1053)				
28.1	Ladders provided for access to work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.2	Ladders meet requirements of OSHA 1926.1053.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.3	Portable ladders set on solid bare ground. Space around top and bottom of each ladder kept clear.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
28. Ladders (OSHA 1926.1053)—continued				
28.4	Portable ladders tied or blocked to prevent movement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.5	Minimum dimensions of job-made wooden ladders are: 2- by 4-inch side rails, 16 feet long, 3/4- by 3-inch cleats 18 to 23 inches long, and 12 inches between cleats. Rails notched to fit cleats, or fill blocks used to secure cleats.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.6	Length between supports (base and top landing) of job-made ladders does not exceed 30 feet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.7	Top of each ladder extends at least 36 inches above top landing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Scaffolding				
29.1	Guardrails, sides, and ends installed on all platforms that are 45 inches wide or less and built more than 4 feet aboveground or adjoining surfaces and on all platforms built more than 10 feet aboveground or adjoining surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.2	Guardrail dimensions are 2- by 4-inch rails installed 42 inches above floor, 1- by 6-inch intermediate rail, 4-inch-high toeboard, and 2- by 4-inch supports at 8-foot spacing. (OSHA 1926.451(b)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.3	Platform planking extended at least 6 inches over supports. Planking overlapped 12 inches or anchored.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.4	Ladders provided for access.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.5	Overhead protection provided in hazardous areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.6	Platform surfaces kept clean so workers are not in danger of tripping.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.7	Design and construction of wooden scaffolds meet requirements. (OSHA 1926.451)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.8	Metal tube and coupler scaffolds meet requirements. Scaffolds erected as specified by manufacturers. Expected loading meets minimum safety factor. (OSHA 1926.451)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.9	Metal scaffolds installed plumb and level, and anchored to structure. Maximum scaffold dimensions are 30 feet horizontal by 26 feet vertical.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Floor and wall openings and stairways				
30.1	Floor openings covered on all sides except at entrances protected by covers or guardrails. (OSHA 1910.23(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.2	Guardrails built if wall openings are less than 3 feet above floors, and drops are more than 4 feet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.3	Toeboards built if wall openings are more than 3 inches above floors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.4	Guardrails built along open-sided floors that are 6 feet or more aboveground.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.5	Handrails built along stairways that have at least four risers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.6	Handrails placed 30 to 34 inches above the top of each riser. Raised handrail built along open side of stairs and landings. (OSHA 1910.23(e)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.7	Smooth surfaces of handrail material positioned on top and sides. Handrail mounted at least 3 inches from sidewalls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.8	Stairs interrupted every 12 feet (vertical distance) with 30-inch landing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Conveyor				
31.1	Operators' stations equipped with start and stop controls. (OSHA 1926.555(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.2	Warning signal included in conveyor equipment. Signals tested before conveyors are started. (OSHA 1926.555(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.3	Access ladders, platforms, and walkways with guardrails and handrails provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
31. Conveyor—continued				
31.4	All moving parts properly guarded. (OSHA 1926.555(a)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.5	Screen installed to protect workers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.6	Conveyors locked out and tagged during repairs. (OSHA 1926.555(a)(7))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Motor vehicles and mechanized equipment				
32.1	Lights or reflectorized barricades placed around equipment parked adjacent to highways or streets. (OSHA 1926.600(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.2	Safety tire cages used when inflating tires on split or lock-type rims. (OSHA 1926.600(a)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.3	Before repairs are started, controls set in neutral, brakes set, and motor shut off. (OSHA 1926.600(a)(3)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.4	Blocking and cribbing provided to prevent movement of equipment during repairs. (OSHA 1926.600(a)(3)(ii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.5	Safety precautions to be taken with all parked equipment include: setting brakes, chocking wheels, and fully lowered blades, buckets, and dump beds. (OSHA 1926.600(a)(3)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.6	Special caution taken in changing and charging batteries to prevent acid contact with eyes and skin.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.7	Passengers transported only in cabs or vehicles. Mounting and dismounting from moving vehicles not allowed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Pile driving equipment				
33.1	Boilers, compressors, and piping systems maintained in good condition. Equipment has protective guards. (OSHA 1926.603(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.2	Stop block positioned in leads to prevent hammer from striking head block. (OSHA 1926.603(a)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.3	Safety block inserted in leads to support hammer when workers are below hammer. (OSHA 1926.603(a)(5))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.4	Cable guards installed across head block sheaves. (OSHA 1926.603(a)(6))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.5	Fixed leads equipped with rings for attaching safety belt lanyards. (OSHA 1926.603(a)(8))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.6	Work platforms and leads protected by guardrails.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.7	Safety chains (1/2-in-diameter) attached at steam and air hose connections and to hammers. (OSHA 1926.603(a)(10))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.8	Steam and air lines equipped with two controls—one has quick-action capability and is at operator's station. (OSHA 1926.603(a)(11))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.9	Guys, outriggers, and counter balances installed to stabilize equipment. (OSHA 1926.603(a)(12))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.10	Piles secured to hoisting lines for placement in leads.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.11	Employees kept clear of area when piles are hoisted. (OSHA 1926.603(c)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.12	Pile driving operations stopped during cutoff of adjacent piles if within a distance equal to two times the length of the longest pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.13	Pit walls sloped or sheet piling placed, and braced before each pile is driven.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.14	Only authorized personnel allowed in work area during driving operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Excavations, trenching, and shoring				
34.1	Walkways and runways kept clear of excavated material. (OSHA 1926.651(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
34. Excavations, trenching, and shoring—continued				
34.2	Walkway planks placed parallel to length of walk, closely spaced, fastened to prevent displacement, and cleaned if slick conditions will prevail. (OSHA 1926.651(c)(1)(ii))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.3	Reflectorized vests worn by flagmen and others exposed to traffic. (OSHA 1926.651(d))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.4	Personnel not permitted under loads being handled by power equipment. (OSHA 1926.651(e))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.5	Truck and other haul-unit operators kept clear of units during loading (exception allowed if cab is braced and shielded).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.6	Wells, pits, and shafts covered or barricaded to protect all personnel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.7	Underground utilities located and staked before excavation. (OSHA 1926.651(b)(2))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.8	Utilities left in place are protected by barricade, shoring, or suspension. (OSHA 1926.651(b)(4))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.9	Excavations sloped to stable angles or shored and braced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.10	Cribbing and shoring installed in accordance with design performed by licensed engineer. (OSHA 1926.652(b)(4)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.11	Excavated material placed and other material stored at least 2 feet from excavation edges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.12	When work is done below hazardous rock slopes, workers and equipment protected by scaling slopes as necessary to minimize danger, bolting rocks and affixing wire mesh after scaling, and placing timber or wire mesh barricades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.13	Scalers equipped with safety belts or boatswain chairs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.14	Scalers' lifelines tied to at least two secure objects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.15	Workers not permitted to work one above the other in rock material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.16	Rock removed from top downward on steep slopes. Access to slope is from top only.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.17	Sides of steep excavations shored and braced when heavy equipment operated close to excavation edges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.18	Dust controlled to acceptable levels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.19	Guardrails built along walkways over excavations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.20	Workers in trenches 5 feet deep or more protected with shields or by sloping or shoring and bracing excavation banks. (OSHA 1926.652(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.21	Trench bracing and shoring installed during excavation: cross braces or jacks placed horizontally, spaced vertically, and secured to prevent unintended movement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.22	Trench supports removed from bottom upward. Ropes used to remove jacks in unstable soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.23	Ventilation provides adequate oxygen and applicable specified atmospheric conditions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.24	Ladders or steps installed no more than 25 feet apart in trenches more than 4 feet deep.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Concrete, concrete forms, and shoring				
35.1	Excavations sloped or shored so forms and concrete materials can be installed safely. (OSHA 1926.652(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.2	Work platforms provided or safety belts worn by workers when reinforcing steel is placed in walls, piers, and columns. (OSHA 1926.501(b)(5))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
35. Concrete, concrete forms, and shoring—continued				
35.3	Work not allowed above unprotected vertical-protruding reinforcing steel. (OSHA 1926.701(b))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.4	Vertical steel is guyed or supported to prevent collapse. (OSHA 1926.703(d)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.5	Wire mesh rolls are secured at both ends to prevent recoiling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.6	Access points at all work areas accessed for safety by contractor before concrete placing begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.7	Silos and bulk storage bins for concrete built with tapered bottoms and equipped with vibrators to start flow. (OSHA 1926.702(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.8	Bull float handles made of nonconductive material. (OSHA 1926.702(h))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.9	Powered concrete trowels equipped with hand-release shutoff switches. (OSHA 1926.702(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.10	Handles on concrete buggies do not extend beyond wheels. (OSHA 1926.702(d))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.11	When pump-creting is used, hose lines and discharge pipe are supported and joints and connectors are protected with safety chains or by other positive methods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.12	Cranes used to position concrete buckets. Crane cable equipped with safety hook. (OSHA 1910.179)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.13	Personnel prohibited from riding concrete buckets for any purpose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.14	Placing and vibrating crews not allowed under suspended buckets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.15	Wheels chocked and brakes set on concrete trucks when discharging on slopes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.16	Protective eye and face equipment worn by workers placing pneumatically applied concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.17	Forms and shoring material are free of splits, rots, cuts, or other defects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.18	Forms installed that will support all concrete loads safely. (OSHA 1926.703(a)(1))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.19	Nails and other accessories removed from stripped forms before stockpiling. (OSHA 1926.25(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.20	Slings fastened securely to gang forms if forms moved by crane.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.21	Workers vacated from lower levels before forms are released and moved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.22	Personnel not permitted to ride forms being raised or moved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.23	Face helmets, goggles, or airline hoods worn by sand blasting crews. (OSHA 1910.94(a)(1)(iii); 1926.57(f)(1)(ii); 1926.57(f)(2)(i))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.24	Eye protection worn by finishers doing chipping or grinding repairs. (OSHA 1926.28(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.25	Concrete heating units and accessories meet safety requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.26	Heating units placed to provide safe clearance from enclosure frames and coverings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.27	Concrete enclosures lighted and ventilated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Blasting and the use of explosives				
36.1	Only authorized personnel permitted to handle or use explosives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.2	Blasting personnel required to furnish evidence of competency in handling and using explosives. (OSHA 1926.901(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.3	Smoking, matches, open flame, sparks, firearms, and other heat-producing devices prohibited near storage magazines and during transport and use of explosives. (OSHA 1926.904(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
36. Blasting and the use of explosives—continued				
36.4	All explosives stored in locked magazines when not being used. (27 CFR Part 55, Subpart K)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.5	Storage magazines ventilated. Magazines are fire resistant, weatherproof, and bullet resistant. (27 CFR Part 55, Subpart K)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.6	Contractors maintain inventory and use records of all explosives. (27 CFR Part 55, Subpart K)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.7	Appropriate authorities notified of loss or theft or of entry into magazines. (27 CFR Part 55.30, Subpart C)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.8	Explosives transported to jobsite in original containers. (OSHA 1926.903(q))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.9	Blasting caps not transported in same vehicle with other explosives. (OSHA 1926.903(p))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.10	Signs, flags, and barricades erected and other precautions taken to ensure employee and public safety. (OSHA 1926.909(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.11	Blasting operations restricted to daylight hours.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.12	All personnel removed from blasting areas during electrical storms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.13	Warning signs, 4-inch red letters on white backgrounds, reading “BLASTING AREA—RADIO TRANSMITTING PROHIBITED,” posted on all roads within 1,000 feet of blasting areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.14	Radio transmitters prohibited within 100 feet of electric blasting caps.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.15	Empty explosive boxes and paper wrappings destroyed by burning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.16	Utility companies and owners or operators of adjacent properties notified before blasting; necessary precautions taken to prevent property damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.17	All blasts fired electrically except in areas of extraneous electric currents. (OSHA 1926.906(e))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Transporting explosives				
37.1	No other material, including blasting caps, transported with explosives. (OSHA 1926.903(p))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37.2	Vehicles are in good condition, and floors are tight with no exposed spark-producing metal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37.3	Warning signs, 4-inch red letters on white backgrounds, reading “EXPLOSIVES,” posted on front, rear, and sides of vehicles. (OSHA 1926.902(h))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37.4	Charged extinguisher with 10 ABC rating carried with each vehicle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37.5	Vehicles not repaired or serviced in shops while carrying explosives or caps.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Loading and wiring				
38.1	Drill holes are sufficiently large to permit free insertion of cartridges of explosives. (OSHA 1926.905(b))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.2	Tamping sticks made of wood or other nonmetallic material. (OSHA 1926.905(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.3	Drilling or heavy equipment prohibited within 50 feet of loaded holes. (OSHA 1926.905(h))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.4	Explosives loaded only in holes to be fired in next round of blasting. (OSHA 1926.905(d))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.5	Blasting wires kept clear of energized electric conduits or wiring. (OSHA 1926.905(j))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.6	Blasting cap wires kept short-circuited until connected for firing. (OSHA 1926.906(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
38. Loading and wiring—continued				
38.7	Caps for single blast determined to be all of same style and manufacture. (OSHA 1926.906(c))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.8	Connecting and lead wires are well insulated and have adequate capacity. (OSHA 1926.906(f))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.9	Number of connected caps does not exceed rated capacity of blasting machines. (OSHA 1926.906(o))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.10	Blasting galvanometers used to test circuits to charged holes. (OSHA 1926.906(q))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.11	Adequate audible warning signals given before and after firing. (OSHA 1926.909(b))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Inspection after firing				
39.1	Firing lines disconnected from blasting machines immediately after firing. (OSHA 1926.906(t))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39.2	All wires traced and checked for misfires by the blasting foreman. (OSHA 1926.911(a))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39.3	If misfires occur, all employees evacuated from blasting areas and kept away for 1 hour.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Blasting agents				
40.1	Blasting agents handled and stored properly (OSHA 1910.109)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40.2	Containers kept dry. Storage areas kept well ventilated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40.3	Workers instructed to evacuate all people from jobsite if there is fire.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Field mixing of fuel-sensitized ammonium nitrate				
41.1	Mixing areas kept clean and free of spilled fuel oil and ammonium nitrate or other explosive materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.2	Ammonium nitrate stored away from fuel oils.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.3	High volatility fuels such as gasoline not used for mixing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.4	Maximum of 8 percent fuel oil used in blasting agents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.5	Smoking prohibited in mixing areas. Signs posted: "NO SMOKING."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.6	Mixing equipment grounded and bonded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.7	Vertical holes loaded by pouring the premixed agent into holes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.8	Safety precautions observed for wiring and shooting (same precautions taken for conventional explosives).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.9	Maximum of 1 day's production of field-mixed ammonium nitrate blasting agent permitted in or near mixing area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

NEH 645 CL 5.1 Construction Surveying Checklist

This checklist is intended to be a guide for an NRCS QA inspector in preparation for and in performance of the inspection of construction surveying for NRCS engineering projects. It may not address all items required of the QA inspector, and some parts of the checklist may not be applicable to a particular project.

Project Name: _____ Project No: _____

Location: _____ Date: _____

Work Period: _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector: _____

QC Inspector: _____

Surveyor: _____

Items Surveyed (include contract item number where applicable): _____

No.	Inspection item	Yes	No	NA
1. Equipment and materials				
1.1	Equipment and materials are adequate for staking the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Equipment and materials are adequate for capturing and recording ground line topography if required by the specification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Electronic data collector is functioning properly and is accurately recording and storing survey data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Inspector's surveying equipment and materials are maintained in proper working condition and are adequate for performing staking, checking, and note keeping necessary to inspect the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Quality of work				
2.1	Stakes are accurately placed and clearly marked to define the work for construction to the specified lines and grades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Survey detail is adequate to accurately represent the ground line or feature surveyed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Primary control				
3.1	Primary control is available and maintained during the performance of the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	The proper bench marks and markers are referenced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	All benchmarks and reference markers established from primary control are accurate within the specified or otherwise acceptable degree of error.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
4. Staking and quantity surveys				
4.1	Submittals that must be submitted prior to surveying have been submitted prior to beginning construction surveying operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	The surveying plan seems reasonable and is revised, as needed, to align with the current construction schedule.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	The number and location of stakes is adequate to define the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Stakes are legibly marked and the markings are complete and accurate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Stakes are being maintained and promptly replaced by the contractor when damaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	All quantity surveys necessary for computing final pay quantities are adequate to thoroughly and accurately define the specified pay limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Checking, interim staking, and interim quality surveys				
5.1	QC personnel are checking to verify construction to the specified line and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Blue tops are set and maintained to the specified line and grade until no longer needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Alignment and grade stakes for structures are set, marked, and maintained as required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Interim quantity surveys are adequate for estimating quantities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Engineering notes				
6.1	All notes, sketches, and other data are presented as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	All engineering notes are transmitted to the COR/GR within the specified time frame.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. As-built surveys				
7.1	Are made where necessary to document changes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Document construction to the lines and grades shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Represent the as-built conditions including any changes from the original plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Accurately capture and document the specified pay limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. As-built records				
8.1	A neat and legible field copy of as-built drawings is maintained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	All changes have been included in the as-built records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	All as-built records are submitted to the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Contractor performed as-built drawings meet specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

NEH 645 CL 5.2 Quantity Computations Checklist

This checklist is intended to be a guide for an NRCS QA inspector when performing or inspecting the performance of quantity computations for NRCS engineering projects. It may not address all items required of the QA inspector, and some parts of the checklist may not be applicable to a particular project.

Project Name: _____ Project No: _____

Location: _____ Date: _____

Work period: _____ A.M./P.M. to _____ A.M./P.M.

QA inspector: _____

QC inspector: _____

Final computations performed by: ☐ Contractor ☐ Sponsor ☐ NRCS

Items computed (include contract item number where applicable): _____

No.	Inspection item	Yes	No	NA
1. Format				
1.1	The heading contains sufficient information to: <ul style="list-style-type: none">– fully identify the project and the computations– indicate the name of the person performing the computations and the date performed– indicate the name of the person checking the computations and the date checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Sketches, explanations, and references are adequate to explain the computation method.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Computations are broken down into simple steps.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Computations include the four basic parts: 1. Description, 2. Data origin, 3. Pay limits, and 4. Solution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	State format is used where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Computations are neat, legible, concise, and well organized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Units and precision				
2.1	All measurement, computation, and conversion units are shown.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Computation precision is consistent with data precision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Computation precision is consistent with the accepted practice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection Item	Yes	No	NA
3. Linear Computations				
3.1	Linear measurements are made as specified (based on slope distance or horizontal distance).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Linear computations are consistent with specified measurement and payment method.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Area Computations				
4.1	Area measurements are made as specified (based on slope distance or horizontal distance).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	The correct equation or mathematical process is applied to arrive at the answer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Volume Computations				
5.1	The specified or otherwise correct equations or mathematical processes are applied to arrive at the answers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Data for computations are representative of the groundline.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	The frequency of surveyed sections complies with specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Curve corrections are made when applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Weight				
6.1	A copy of all delivery tickets for items to be paid on a weight basis are obtained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	All delivery tickets are submitted to be filed in the contract "quantities" folder.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Delivered and installed quantities for each day or reporting period along with cumulative delivered and installed quantities are documented in the job diary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Interim Quantities				
7.1	Interim quantities are recorded in a legible and orderly fashion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Interim quantity records are kept until the contract has been finalized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Computations Performed by the Contractor				
8.1	When quantity computations are to be performed with computer software, survey activities do not begin until software identification, vendor's name, version number, and other pertinent data has been provided to the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	All quantity computations are performed and presented in the specified manner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	Computations are submitted within the specified time frame.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

NEH 645 CL 6.1 Construction Erosion And Pollution Control Checklist

Use of this checklist as a guide to assess the performance of erosion and pollution control activities is optional. All items required to verify compliance with contract specifications or regulations may not be listed. Some of the listed items need only be checked one time; most items are ongoing and should be checked periodically and after storm events.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

No.	Inspection item	Yes	No	N.A.
1. Permitting Requirements				
1.1	NOIs submittal requirements are met before construction start.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Notice is posted and maintained per CGP requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	SWPPP is implemented and revised as necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Site inspections are conducted and documented as required by the CGP.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	NOI, SWPPP, inspection reports, and the full text of the CGP are maintained on site readily accessible for audit by the authority.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	After construction, records are transmitted with other contract documents to be maintained for the specified period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Best Management Practices				
2.1	BMPs are implemented or installed and maintained in accordance with Construction Specification 5 and the SWPPP.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	BMPs that require periodic sediment removal are being maintained. .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	BMPs that will be permanent are functioning as intended or the responsible engineer has been notified that modifications to them may be needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	BMPs are modified when necessary to function as intended.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Responsible engineer is notified of quantity variations requiring contract modification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Modifications are in place before beginning significant added work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	Temporary BMPs are removed when no longer needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Chemicals				
3.1	Onsite chemicals have been noted and are being managed to reduce their potential for pollution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Chemicals are being maintained and used in compliance with regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Chemical disposal is in compliance with regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Sanitary facilities are being maintained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Fuel storage and fueling of equipment complies with regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Equipment leaking fuel or lubricants is removed from service.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	Chemical spills are promptly addressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.8	Authorities are notified when a chemical spill occurs that could pollute ground or surface water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Air Pollution				
4.1	Items of work that could contribute to air pollution comply with specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	All permits related to air quality have been obtained by contractor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Burning is being conducted in a safe manner with precautions taken and measures in place to prevent and arrest unwanted fires.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	All burning facilities, especially forced-air burning, are positioned to avoid damage to any structure, utilities, fuel storage areas, and equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	For forced-air burning, blowers are positioned to allow for operation and maintenance for the duration of the burn.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Dust is suppressed in compliance with specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Handling of fine particle materials is in a manner to limit dust production.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Filters and dust suppressors are functioning properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

NEH 645 CL 7.1 Foundation Preparation Checklist

The following checklist provides guidance for examining the quality of foundation preparation. The checklist does not address all of the conditions that may exist related to foundation preparation. The checklist should be used for guidance only as the inspector examines the work and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project Name _____ Project No. _____

Location _____ Date: _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector: _____

QC inspector: _____

Work inspected (include contract item number where applicable): _____

No.	Inspection item	Yes	No	NA
1. Clearing and grubbing				
1.1	The limits for clearing and grubbing are clearly marked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Surveys are completed prior to clearing and grubbing when necessary for computing quantities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	All materials are removed and disposed of as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	The contractor's operation does not damage adjacent property.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	The contractor's operation does not damage trees that shall remain.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Burning is performed according to local ordinances and job specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	The timing and rate of clearing conforms to specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Structural removal				
2.1	Structural removal limits are clearly identified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	All materials are removed and either salvaged or disposed of as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	The removal operation does not damage adjacent property.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Burning is performed according to local ordinances and job specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Stripping				
3.1	The areas to be stripped are staked per plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Stripping is performed to the minimum specified limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
3. Stripping—continued				
3.3	All unsuitable materials are removed and disposed of as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Surveys are performed as needed for quantity computations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	The responsible engineer is consulted if there are uncertainties about the suitability of stripped materials for construction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Stripping below the specified lower limits is quantified and paid for as foundation excavation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Scarifying				
4.1	All holes or depressions are filled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Materials used to fill holes are compacted as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	The foundation is scarified to the specified extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Large rocks brought to the surface are removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Dispersive, collapsible, and soluble materials				
5.1	The foundation and surrounding areas are visually inspected for signs of dispersive, collapsible, or soluble materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Tests to verify the existence of dispersive, collapsible, or soluble materials are conducted when applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	The responsible engineer is contacted whenever the presence of dispersive, collapsible, or soluble materials is suspected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	All dispersive, collapsible, and soluble materials are removed from the foundation to the depth and extent specified or as otherwise directed by the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Surveys to quantify the amount of dispersive, collapsible, and soluble materials are completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Documentation is obtained as necessary to compensate the contractor for added work caused by removal of dispersive, collapsible, and soluble materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Foundation compaction and moisture control				
6.1	The moisture and density of the foundation meets or exceeds the specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Adequate numbers of moisture/density tests are taken to document that specification requirements are met.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The responsible engineer is consulted if it is necessary to deviate from the specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Preparing rock foundations				
7.1	All loose undesirable materials are removed and the foundation surface is cleaned as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	All cracks, crevices, and overhangs are cleaned and concreted or grouted and there are no negative slopes or overhangs remaining on the foundation surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	All loose and weathered materials are removed from the foundation surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Subsurface grouting is performed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	The responsible engineer is notified of discrepancies between design and field conditions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	The geologist and the responsible engineer are consulted to determine the full extent of documentation needed to adequately document foundation preparation measures and procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
8. Cutoff trench				
8.1	The cutoff trench is staked at the specified location and quantity surveys are attained to define the upper limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	The trench is excavated to the specified or modified limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	The trench extends to or into the specific layer of material shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Changes to the lower limits are documented and approved by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5	When applicable, lower limits are surveyed for quantity computations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.6	Foundation materials are at the specified moisture and density at the time of backfill placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.7	Only specified and suitable materials are placed in the cutoff trench.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.8	Materials are placed at the specified moisture and compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Foundation drains				
9.1	Foundation drains are staked and drainfill quantity surveys attained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Foundation drains are constructed to the specified limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	Segregation of drainfill materials is prevented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.4	Internal perforated pipes are undamaged, clear of obstructions, and placed at the proper location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.5	Drainfill materials are compacted to meet specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Final foundation preparation				
10.1	All unsuitable materials have been removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	The cutoff trench is installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	Drainage features are installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.4	Just prior to placing earthfill, the moisture content and density of the foundation meet specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.5	All subsurface grouting has been completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.6	All rock surfaces are cleaned and grouted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.7	All loose and drummy rock has been removed from the surface	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.8	All negative slopes have been corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

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NEH 645 CL 7.2 Removal of Water Checklist

The following checklist provides guidance for examining the quality of implementation of the removal of water plan. The checklist does not address all of the conditions that may exist related to removal of water. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project name: _____ Project #: _____

Location: _____ Date: _____

Work period: _____ A.M./P.M. to _____ A.M./P.M.

QA inspector: _____

QC inspector: _____

Work inspected (include contract item number where applicable): _____

No.	Inspection item	Yes	No	NA
1. General				
1.1	The accepted plan for removal of water is implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Required permits have been obtained prior to beginning work in or around streams or wetlands, including the U.S. Army Corps of Engineer's 404 Permit and EPA or State stormwater permit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Details of equipment installation and performance of plan are documented in the diary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Removal of water efforts are adequate to allow the performance of the work as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Contractor is made aware of inadequate removal of water efforts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Removal of water efforts do not adversely affect the stability of slopes or the foundation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Neither surface or ground water is being polluted by removal of water efforts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Precautions are taken to protect the environmental aspects of the stream or wetlands, including required pollution control measures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	Contractor is made aware of concerns of instability and pollution and related discussions with contractor are well documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Responsible engineer is consulted when contractor's removal of water efforts are inadequate or result in slope instability or pollution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
1. General—continued				
1.11	Invoiced amounts for removal of water are consistent with documented performance of work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.12	Quantity of pumped water is documented in the diary for each reporting period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.13	When payment is based on quantity of water pumped, pump accuracy is verified by the contractor and is checked periodically or when accuracy is suspect.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.14	All temporary works for the removal of water are removed and disposed of in a manner that does not adversely impact the permanent structure or the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Surface water				
2.1	Dewatering and drainage control systems are correctly installed according to the removal of water plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Dewatering and drainage control systems are maintained and functioning to allow work to be performed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	If water pumped from dewatering systems is muddy or contains fine sand, wells are sealed and wellpoints with an adequate filter system are installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Backup power and standby pumps are immediately available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Diversion outlets empty in a nonerosive manner into the same drainage way that the water would have reached had it not been diverted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Dikes and mounds of soil in the borrow area are graded as the work progresses to blend in and avoid leaving shallow areas within the pool.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	When a dam is being constructed, the top of the dam is maintained as near level as possible to allow flow to uniformly spread across the full width of the dam should the uncompleted dam be overtopped.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.8	Cofferdams are maintained and not repeatedly emptied by breaching and allowing water to flow through the worksite.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.9	Compliance with requirements that diverted surface water must be returned to its original drainage way before leaving the site or owner's property.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.10	Borrow areas are maintained as the work progresses so that dikes are knocked down to avoid leaving shallow areas within the pool.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.11	Emergency outlets are located so that their function will not result in flow being concentrated over any part of the dam.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.12	Embankment is maintained approximately level during construction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.13	All avenues for surface water to enter an internal drainage system are sealed as the work progresses and those that must remain unsealed to facilitate construction are sealed when it appears eminent that a runoff event could result in surface flow or inundation at the opening.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Groundwater				
3.1	Dewatering and drainage control systems are correctly installed according to the removal of water plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Dewatering and drainage control systems are maintained and functioning to allow work to be performed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	If water pumped from dewatering systems is muddy or contains fine sand, wells are sealed and wellpoints with an adequate filter system are installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Backup power and standby pumps are immediately available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Concrete is not placed on a wet foundation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Standing or flowing water does not come in contact with concrete until it has achieved its initial set.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
4. Erosion, pollution control, and removal of temporary works				
4.1	Required permits have been obtained and, when required, copies are available on the jobsite prior to beginning work in or around streams or wetlands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Best management practices (BPMs) are installed and maintained as required by the Stormwater Pollution Prevention Plan (SWPPP).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Precautions are taken to protect environmentally sensitive streams during stream diversion and associated construction activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Water is diverted from slopes and slopes are protected to reduce erosion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Care is exercised when removing dewatering system filter components to minimize the loss of trapped sediment, debris, and other pollutants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

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NEH 645 CL 7.3 Excavation Inspection Checklist

Use of this checklist as a guide to assess the performance of erosion and pollution control activities is optional. All items required to verify compliance with contract specifications for regulations may not be listed. Some of the listed items need only be checked on time; most items are ongoing and should be checked periodically and after storm events.

Project Name _____ Project no. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

No.	Inspection item	Yes	No	N.A.
1. Safety				
1.1	Qualifications of equipment operators and the conditions of the excavating equipment comply with safety regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Contractor's excavation safety plan has been reviewed and discussed with all employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	All employees have been informed of what to do in emergency situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Contractor operations comply with OSHA regulations related to excavations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Trenching operations are supervised by a competent person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Spoil materials are placed a safe distance from excavation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Confined space air quality is addressed where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Amount of trench excavated at any one time is limited to no more than can be maintained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	Shoring, trench boxes, and trench access ladders are installed per OSHA requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Consideration is given to changing soil conditions of moisture and freeze/thaw, surcharge loads, equipment operation, and other conditions that may cause excavations to be unstable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Buried utilities				
2.1	An NRCS employee has checked with the land owner, operator, or sponsoring organization to determine if there are underground utilities known to be in the work area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	An NRCS employee has checked for records of known utilities on file in the field office.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	The land owner, operator, sponsoring organization, or prime contractor: ____ called the state one-call number to ascertain the presence of utilities ____ notified the utility owner of the time, place, and type of work to be done ____ requested that the buried utility be located and marked by the utility owner ____ requested that a representative of the utility owner be present during excavation operations ____ notified the excavation contractor of the location of known utilities, and ____ completed, signed, and returned the NRCS-ENG-005 to the NRCS			
2.4	NRCS-ENG-005 and 006 are completed and filed in the local field office or contract file.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Excavated materials				
3.1	Materials being excavated are properly classified as common, rock, or unclassified excavation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Topsoil has be stockpiled for final grading.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Excavated materials are used as specified per USCS classification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Soils unsuitable for a construction material are disposed of as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Changes in excavation limits or class of excavation are documented and addressed in compliance with specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Any concerns about excavation operation inefficiency are documented and elevated to the engineer in a timely manner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	The engineer is promptly notified when it is anticipated that a change in materials will result in a significant change in the quantity or scope of work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.8	Details and related conversations of any change or added work related to materials is recorded in the job diary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.9	Surveys are made to define the excavation or material class limits needed for adjusting payment quantities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.10	Excavation extends to the specified limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.11	All changes to excavation limits are documented on the as-built plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Blasting				
4.1	No blasting materials are transported to the site until the contractor's blasting plan is accepted by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	The blaster has obtained a blasting permit if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Blasting operations comply with the accepted blasting plan as follows: ___ operations are directed and supervised by the person(s) listed in the blasting plan ___ materials are stored, transported, and handled in accordance with the blasting plan ___ safety measures are implemented according to the blasting plan ___ the depth, direction, spacing, and loading of the holes are consistent with the blasting plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Adjustments are made in the blasting plan to prevent over-blasting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Pre-blast conditions of potentially affected buildings, structures, or are well documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Monitoring is implemented when specified or planned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Photo documentation of pre and post-blast conditions are referenced in the job diary and on WS 7.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	All blasting operations and related activities are documented in the job diary and on WS 7.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Disposal of excavated materials				
5.1	All suitable materials are used as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Where specified, top soil is salvaged and stockpiled in designated locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Excavated unsuitable or surplus materials are disposed of as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	No unsuitable materials remain in areas from which they are to be removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Borrow areas				
6.1	Borrow areas have been staked or otherwise delineated in the field.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Borrow areas have been cleared as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Provisions are made to dispose of unsuitable borrow materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	The responsible engineer is notified if it appears borrow area will be inadequate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	Where applicable, surveys are obtained for borrow quantity computations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	Water content of borrow materials is adjusted, as needed, prior to transporting materials to the fill area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	Borrow areas are smoothed and piles of materials cut down to eliminate shallow areas within the pool that could be a boating hazard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	Borrow areas are sloped and graded as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.9	Borrow areas above permanent waterline are covered with topsoil and vegetated or otherwise stabilized as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Final grading				
7.1	Grade stakes are accurately placed and regular grade checks are made.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Final grading is made to the specified lines and grades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Overexcavation is avoided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Grading is avoided when the soil is too wet, too dry, or frozen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

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NEH 645 CL 8.1 Earthfill and Earth Backfill Inspection Checklist

The following checklist provides guidance for examining the quality of earthfill. The checklist does not address all of the conditions that may exist related to earthfill. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project

Project Name _____ Project No. _____

Location _____ Date: _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work Inspected (Include contract item number where applicable): _____

No.	Inspection item	Yes	No	NA
1. Materials				
1.1	Materials being used are properly identified and do not differ significantly from those materials specified in design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Materials are routed to the specified locations in the earthfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Frozen materials are not used in any earthfill or earth backfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Moisture content of borrow materials is within the specified range or can be adjusted to comply with specification requirements before compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Significant changes in materials are promptly reported to the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Foundation preparation				
2.1	The foundation is prepared as specified prior to any placement of materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Surface and subsurface drainage features are in place to control water during earthfill or backfill operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Clearing and foundation preparation operations comply with safety standards with an emphasis on excavation safety.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Placement and processing				
3.1	Earthfill zones are properly staked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Earthfill is installed at locations designated in the drawings and specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	The foundation and/or embankment surfaces are conditioned for bonding and comply with the specified grades and density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Oversize stones, roots, and debris are removed before compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	The type of earthfill materials comply with specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
3.6	The top surface of embankment earthfill is maintained approximately horizontal except for a slight slope, as needed, for drainage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	Earthfill or backfill has been placed, moisture adjusted, and processed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.8	Frozen materials have not been placed; nor have materials been placed on any frozen foundation or fill surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Moisture control				
4.1	Foundation moisture is within the specified range.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Compaction moisture is within the specified range throughout the full depth of the lift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Added water is properly incorporated into the earthfill to produce a uniform moisture content throughout the lift thickness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Compaction				
5.1	Appropriate compaction equipment is being properly used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Compaction equipment is being controlled to provide a systematic and complete coverage of entire area requiring compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	For Class A and B compaction, the specified density is attained throughout the full depth of each lift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	For Class C compaction, the prescribed equipment and method are being consistently applied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Backfill is protected from drying and cracking until permanently covered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Structural damage is avoided by not over-compacting backfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	For zoned embankments, all zones are located and configured as specified or as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Sampling and testing				
6.1	Testing locations are truly representative of the section or area being evaluated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Areas of suspect compaction effort or areas suspected of being too dry or too wet are tested.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Soil samples to be tested are properly protected to prevent loss of moisture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	Where undisturbed soil samples are needed for testing, the sample is properly extracted and protected from damage until it is tested.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	All tests are performed in strict accordance with the specified test standard and are appropriate for the soils being tested.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	A moisture and density correction is made according to ASTM D4718 whenever the soil being tested contains significant amounts of oversize particles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	Test location and results are promptly recorded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Evaluating test results				
7.1	The selected Proctor curve represents the soil or composite soils being tested.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Test results are reasonable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Soils are retested if initial test results are unreasonable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Actions are taken to correct noncompliant work when reasonable test results fail.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	Any reworked areas are again tested to verify and document compliance with specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
8. Records and reports				
8.1	The method used to select the Proctor curve is noted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	The horizontal and vertical location of tests and the area represented by the test are recorded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	The standard test method is employed and the results are recorded as required by the test method.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Actions or additional testing for verification of test results is documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5	Any actions taken to correct non-compliant work are documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.6	The specific worksheet where test results are recorded is referenced in the job diary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

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NEH 645 CL 8.2 Rockfill Inspection Checklist

The following checklist provides guidance for examining the quality of rockfill. The checklist does not address all of the conditions that may exist related to rockfill. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project

Project Name: _____ Project No.: _____

Location: _____ Date: _____

Work Period: _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector: _____

QC Inspector: _____

Work Inspected (Include contract item number where applicable): _____

No.	Inspection item	Yes	No	NA
1. Materials				
1.1	Only rockfill materials meeting job specifications are installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Rockfill materials are routed to the specified locations in the rockfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Significant changes in materials are promptly reported to the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Foundation preparation				
2.1	The foundation is prepared as specified prior to any placement of materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Surface and subsurface drainage features are in place to control water during rockfill operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Clearing and foundation preparation operations comply with safety standards with an emphasis on excavation safety.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Placement				
3.1	Rockfill zones are properly staked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Rockfill is installed at locations designated in the drawings and specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Prescribed placement methods are followed to produce a competent rockfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Lift thicknesses are appropriate for the material being placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Moisture control				
4.1	Excessive moisture is avoided if it adversely affects other operations or the placement, processing, and compaction of surrounding earthfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Compaction				
5.1	The specified equipment is used and specified method of compaction is strictly followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Compaction equipment is in good condition and being operated properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
5.3	Compaction equipment is being controlled to provide systematic and complete coverage of entire area requiring compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	The proper sequence of placing and compaction of transition zones is implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	All zones are located and configured as specified or as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Records and reports				
6.1	The horizontal and vertical locations of non-compliant work limits are recorded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Any actions taken to correct non-compliant work are documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

NEH 645 CL 9.1 Soil-Cement Checklist

The following checklist provides guidance for examining the quality of soil-cement construction. The checklist does not address all of the conditions that may exist related to soil-cement construction. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work Inspected (Include contract item number where applicable) _____

No.	Inspection item	Yes	No	NA
0. Soil Material Hazards				
0.1	Material hazard datasheets are reviewed by on-site NRCS and contractor personnel prior to handling or working around amendments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.2	Material hazards are addressed in the safety plan, safety meetings, and whenever appropriate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.3	First aid provisions and a plan of action are in place to address illness resulting from exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.4	Materials are handled and used in a safe manner to protect workers and the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.5	Protective equipment is worn as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.6	Safety concerns are documented and addressed as soon as they are recognized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Materials				
1.1	Deleterious materials and rock particles larger than the maximum specified are removed before mixing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Soil is of the type specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Gradation and Atterberg limits test data are obtained when specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	For soil with gradation and plasticity markedly different from that specified, test data is provided to show that soil-cement made with these soils is of a quality equal to or exceeding the required quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Cement meets specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Cement is stored in a dry and uncontaminated condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Pozzolan, when used, meets specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Pozzolan, when used, is stored in a dry and uncontaminated condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
1.9	Water meets specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Curing compound meets specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11	Changes in the source of soil, water, cement, pozzolan or curing compound are made known to the Engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Equipment				
2.1	Mixing equipment is in place and properly functioning as discussed in the section in this chapter entitled Proportioning and Mixing (Soil-Cement).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Equipment used to transport and apply cementitious materials is covered or enclosed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Application equipment is capable of uniformly applying cementitious materials at the specified rate with little or no dust problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Compaction equipment is suited for compacting the soil-cement to the planned lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Equipment that is to operate on soil-cement does not leak fluids or mar or loosen surface of compacted soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Mix Design				
3.1	Materials and mix proportions are in accordance with the job mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Other than minor changes in water content, the job mix does not change without the Engineer's concurrence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Site Preparation				
4.1	The area to receive the remotely mixed soil-cement is shaped to the proper line and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	The subgrade surface is moistened prior to placing remotely mixed soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Where in situ soil is used, it is loosened to the specified depth and pulverized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	The pulverized in situ soil is graded to the proper line and grade before adding cementitious materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Soil to be mixed with cement is free of deleterious material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Rock particles larger than the maximum size specified are removed from the soil before mixing in the cementitious material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Proportioning and Mixing				
5.1	The plant operator exhibits the capability to oversee the proportioning and mixing operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Equipment is in good condition, has adequate capacity, and hoppers discharge completely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Drums are inspected and cleaned periodically and are not overcharged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Adequate quantities of all ingredients (soils, cement, pozzolan, and water) are available on site to allow uninterrupted production.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Only specified soils are used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Soil moisture is 1 – 2% below optimum when cementitious materials are added.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Soil-cement is mixed immediately after the cement is added.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.8	Mix moisture tests are conducted and water is added to bring moisture of the mixture to within the specified range for compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.9	The plant operator visually inspects the mix for uniformity on a continuous basis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
5.10	Quality control personnel visually inspect the mix for uniformity on a periodic basis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.11	The mixture has uniform color, moisture, and cement content or uniformity problems are isolated and corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.12	Mix uniformity is documented periodically and before and after uniformity problems are corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Transporting and Placing				
6.1	Foundation or lift joint preparation is complete as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Mixture is not contaminated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Transport containers do not leak.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	Haul time does not exceed 30 minutes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	Mixture is protected from rainfall or excessive drying from wind and sun.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	Equipment does not damage previously placed and compacted soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	Soil-cement is spread in lifts of a uniform thickness resulting in compacted layers of the specified grade and thickness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	Mix is placed in a configuration that limits edge joints.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.9	Thickness of lift does not exceed the depth that can be efficiently mixed and compacted with available equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.10	The surface of soil-cement that is more than 2-hours old is treated as specified before being covered by a new layer of soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.11	Placement does not occur if the air temperature is less than 40oF.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.12	Placement does not occur if the foundation or the soil used to make the soil-cement is frozen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.13	Placement does not occur if the soil-cement cannot be completely compacted and protected before the onset of damaging weather.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.14	Whenever the air temperature is expected to be below 45oF, the planned method of protection is approved by the engineer before soil-cement is placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.15	Whenever the air temperature is expected to be below 45oF, protection equipment and materials are on-site and ready to be employed as per the approved protection plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.16	Mix contains specified moisture in preparation for compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.17	Moisture adjustments are made without damage to underlying materials or the mixing of foundation materials into the soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Compaction				
7.1	Sheepsfoot or other deep penetrating compactors are not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	The soil-cement is compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Compaction is attained throughout the entire depth of the lift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Lift thickness is controlled or compaction effort is increased to prevent surface damage caused by over compacting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	Raw unmixed soil is not bladed onto the soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	Compaction is accomplished as soon as possible after the soil-cement is placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Curing				
8.1	Prior to beginning soil-cement placement, curing equipment and materials are on site and ready to be deployed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
8.2	Curing begins immediately after compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	Curing continues until the soil-cement has been maintained at or above 40oF for 7 days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Application of curing water does not erode the surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5	Coverings are secured to prevent the movement of air between the soil-cement and the covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.6	White or reflective coverings are used during hot weather.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.7	Curing compound conforms to specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.8	The entire surface to be cured with curing compound is uniformly covered at or in excess of the manufacturer's recommended rate and the specified rate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.9	Curing compound is not applied to bonding surfaces or areas to be repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.10	The surface is kept continuously moist until curing compound is applied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.11	All standing water is removed prior to applying the curing compound.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.12	Curing compound is applied in a timely manner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.13	Curing compound is reapplied every 7 days during the curing period when the curing period is extended beyond 7 days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Protection				
9.1	Soil-cement is protected against erosive rainfall or flowing water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Cold weather plan is implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	Vehicular traffic is prohibited if it causes damage to the soil-cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

Comments _____

NEH 645 CL 9.2 Lime-treated Earthfill Checklist

The following checklist provides guidance for examining the quality of lime-treated earthfill construction. The checklist does not address all of the conditions that may exist related to lime-treated earthfill construction. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work Inspected (Include contract item number where applicable) _____

No.	Inspection item	Yes	No	NA
0. Soil Material Hazards				
0.1	Material hazard datasheets are reviewed by on-site NRCS and contractor personnel prior to handling or working around amendments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.2	Material hazards are addressed in the safety plan, safety meetings, and whenever appropriate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.3	First aid provisions and a plan of action are in place to address illness resulting from exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.4	Materials are handled and used in a safe manner to protect workers and the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.5	Protective equipment is worn as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.6	Safety concerns are documented and addressed as soon as they are recognized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Materials				
1.1	Soil is obtained from designated areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Deleterious materials and rock particles larger than the specified maximum allowable size are removed from the soil before mixing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Water conforms to specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Lime complies with the specification and the source and form of lime has been approved by the Engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Equipment				
2.1	Mixing equipment is of the type and size specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Mixing equipment is capable of mixing at various depths up to and including the planned lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Transport equipment is covered or enclosed to avoid dust problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
2.4	Slurry transport vehicles sufficiently agitate the slurry to keep the lime in suspension.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Compaction equipment is capable of compacting the lime-treated earthfill to the full planned lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Mix Design				
3.1	The area to receive the lime is shaped to the specified line and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Topsoil and unsuitable materials are replaced with acceptable material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Subgrade is firm enough to support equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Soil moisture adjustments are made as necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>For Mixing and Curing in a Processing Area:</i>			
3.5	Mixing and curing are conducted at the designated site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	The site is stripped of topsoil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	If specified, topsoil is stockpiled to be placed back on the processing area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.8	The area is graded to a relatively smooth and uniform surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Lime and Soil Proportioning				
4.1	The planned application rate conforms to the specified rate for the form of lime used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Tests such as those to test for Atterberg limits and pH are conducted as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Application rate adjustments are made based on results of tests for strength, plasticity, or pH, as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Rate adjustments are approved by the Engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Lime Application				
5.1	Lime is not applied when the temperature is below 40oF or is expected to drop below 40oF within 24 hours.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Dry lime is not applied in windy conditions that cause dusting problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Tests are conducted to document that lime is uniformly and evenly applied and spread.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	After spreading, dry lime is sprinkled with water to minimize blowing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Caution is taken to avoid exposure to lime dust and steam produced by lime slaking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Where applicable, slurry is evenly distributed and lime is kept in suspension throughout the distribution process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Mixing				
6.1	The depth of lift or layer into which the lime is mixed allows for the proper proportioning of lime and soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	The depth of the mixture is no greater than can be effectively mixed by the mixing equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Soil, lime, and water are processed to provide for a uniform mixture without lumps of soil or lime.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	The water content of the mixture is maintained as specified throughout the mixing process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	The mixture is sealed, as applicable, to prevent evaporation, lime carbonation and excessive wetting from rainfall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
6.6	The process of mixing the lime, soil, and water is completed within the same workday as it is started.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	The mixture is cured as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	When specified, material is remixed after curing to break up clods and reduce any non-slaked lime particles to less than the No. 4 sieve size.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Compaction				
7.1	The mixture contains the specified amount of water evenly distributed throughout the lift being compacted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	The mixture is compacted to the minimum density specified throughout the depth of the lift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

Comments _____

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NEH 645 CL 9.3 Bentonite-treated Soil Checklist

The following checklist provides guidance for examining the quality of bentonite-treated soil construction. The checklist does not address all of the conditions that may exist related to bentonite-treated soil construction. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work Inspected (Include contract item number where applicable) _____

No.	Inspection item	Yes	No	NA
0. Soil Material Hazards				
0.1	Material hazard datasheets are reviewed by on-site NRCS and contractor personnel prior to handling or working around amendments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.2	Material hazards are addressed in the safety plan, safety meetings, and whenever appropriate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.3	First aid provisions and a plan of action are in place to address illness resulting from exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.4	Materials are handled and used in a safe manner to protect workers and the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.5	Protective equipment is worn as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.6	Safety concerns are documented and addressed as soon as they are recognized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Materials				
1.1	Borrow soils are obtained from designated areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	In-place soils are of the type specified or are replaced with the type specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Deleterious materials and rock particles larger than the lift thickness divided by 10 are removed from the soil before mixing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	No more than 25% of the soil is larger than the #10 sieve.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Water is relatively clean and meets specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	When specified, sodium bentonite with a free swell of at least 22 milliliters per 2 grams is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Bentonite is of the specified form (fine powder or coarse granular) or adjustments are made, as necessary, in the proportioning of bentonite and soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
1.8	Bentonite is kept dry until spread.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	Bentonite is protected and handled in a manner to prevent blowing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Workers are protected from breathing fine powder bentonite.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Equipment				
2.1	Mixing equipment is of the type and size specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Mixing equipment can be adjusted for various mixing depths.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Mixing equipment is capable of thorough mixing at the planned lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Equipment used to transport and distribute bentonite is covered or enclosed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Equipment used for spreading is capable of uniformly applying the bentonite at the rate specified with little or no bentonite dust problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Mix Design				
	<i>For In-place Mixing and Curing:</i>			
3.1	The area to receive the bentonite is shaped to the specified line and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Topsoil and unsuitable soils are removed and replaced with acceptable material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	When specified, the subgrade is made filter-compatible with the soil-bentonite mixture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Soil above the subgrade or bottom lift is removed and stockpiled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Oversize particles are removed from soils to be treated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Soil is firm enough to support equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	Soil to be modified has a moisture content that is 1 to 2 percent below optimum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Additional Responsibilities for Mixing and Curing at a Processing Area</i>			
3.8	Mixing and curing are conducted at the designated processing area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.9	Topsoil is stripped and removed to expose the soil that is to be treated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.10	When specified, topsoil is stockpiled to be placed back on the processing area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.11	The area is graded to a relatively smooth and uniform surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Bentonite Application				
4.1	Caution is taken to avoid breathing fine bentonite powder.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Bentonite is not applied in windy conditions that cause dusting problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Bentonite is uniformly and evenly applied at the rate specified for the form of bentonite used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Where the mixture is transported to the placement site, lift seams are staggered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Mixing				
5.1	The depth of the mixture allows for the proper proportioning of bentonite and soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	The depth of the mixture is no greater than can be effectively mixed by the mixing equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	The soil and bentonite are uniformly mixed prior to adding water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Water is evenly distributed throughout the mixture to arrive at the specified moisture content for compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	The process is not begun unless the entire process from bentonite application through compaction can be completed within the same day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
6. Transporting and Placing				
6.1	Compaction is accomplished as soon as practicable after incorporating the bentonite and water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Deep penetrating compaction equipment is not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	The lift thickness is conducive to attaining the specified density throughout the full lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	The mixture is compacted to the minimum density specified throughout the depth of the lift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	On slopes that are steeper than 4H:1V, the compactor is cabled to a dozer or other equipment to prevent slippage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Protective Cover				
7.1	The cover is installed as soon as practicable after completion of the soil-bentonite liner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	The cover is compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

Comments _____

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NEH 645 CL 9.4 Dispersant Checklist

The following checklist provides guidance for examining the quality of dispersant construction. The checklist does not address all of the conditions that may exist related to dispersant construction. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work Inspected (Include contract item number where applicable) _____

No.	Inspection item	Yes	No	NA
0. Soil Material Hazards				
0.1	Material hazard datasheets are reviewed by on-site NRCS and contractor personnel prior to handling or working around amendments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.2	Material hazards are addressed in the safety plan, safety meetings, and whenever appropriate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.3	First aid provisions and a plan of action are in place to address illness resulting from exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.4	Materials are handled and used in a safe manner to protect workers and the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.5	Protective equipment is worn as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.6	Safety concerns are documented and addressed as soon as they are recognized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Materials				
1.1	Borrow soils are obtained from designated areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	In-place soils are of the type specified or are replaced with the type specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Deleterious materials and rock particles larger than the specified allowable maximum particle size are removed from the soil before mixing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Water is relatively clean and meets specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	The specified type of dispersant is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Dispersant is kept dry until spread.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Dispersant is protected and handled in a manner to prevent blowing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Workers and others are protected from breathing the dispersant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
2. Equipment				
2.1	Mixing equipment is of the type and size specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Mixing equipment can be adjusted for various mixing depths.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Mixing equipment is capable of thoroughly mixing at the planned lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Equipment used to transport and apply fine powder dispersant is covered or enclosed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Equipment used for spreading is capable of uniformly applying the dispersant at the rate specified with little or no dispersant dust problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Mix Design				
	<i>For In-place Mixing and Curing:</i>			
3.1	The area to receive the dispersant is shaped to the specified line and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Topsoil and unsuitable soils are removed and replaced with acceptable material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	When specified, the subgrade is made filter-compatible with the soil-dispersant mixture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Soil above the subgrade or bottom lift is removed and stockpiled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Oversize particles are removed from soils to be treated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Soil is firm enough to support equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	Soil has a moisture content within the range specified for compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Additional Responsibilities for Mixing and Curing at a Processing Area</i>			
3.8	Mixing and curing are conducted at the designated processing area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.9	Topsoil is stripped and removed to expose the soil that is to be treated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.10	When specified, topsoil is stockpiled to be placed back on the processing area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.11	The area is graded to a relatively smooth and uniform surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Dispersant Application				
4.1	Caution is taken to avoid breathing dispersant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Dispersant is not applied in windy conditions that cause dusting problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Dispersant is uniformly and evenly applied at the rate specified for the type of dispersant used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Where the mixture is transported to the placement site, lift seams are staggered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Mixing				
5.1	The depth of the mixture allows for the proper proportioning of dispersant and soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	The depth of the mixture is no greater than can be effectively mixed by the mixing equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	The soil and dispersant are uniformly mixed prior to making final moisture adjustment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Water is evenly distributed throughout the mixture to arrive at the specified moisture content for compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	The process of mixing and compacting the dispersant, soil, and water is completed within the same workday as it is started.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Compaction				
6.1	The lift thickness is conducive to attaining the specified density throughout the full lift depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	The mixture is compacted to the minimum density specified throughout the depth of the lift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
6.3	Deep penetrating compaction equipment walks out of the liner or compaction is finished with less penetrating compaction equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	On slopes that are steeper than 4H:1V, the compactor is cabled to a dozer or other equipment to prevent slippage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Protective Cover				
7.1	The cover is installed as soon as practicable after completion of the soil-dispersant liner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	The cover is compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

Comments _____

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NEH 645 CL 10.1 Geotextile Inspection Checklist

The following checklist provides guidance for inspection of the proper installation of geotextiles. This checklist does not address all of the conditions that may exist related to these installations and should be used for guidance only as the inspector examines the work. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work inspected (include contract item number where applicable) _____

No.	Inspection item	Yes	No	N.A.
1. General				
1.1	Safe conditions exist when handling and installing geosynthetics.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Only approved materials are delivered and installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Materials are stored and handled properly and protected from UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	The subgrade or surface upon which geotextiles are to be installed complies with specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Joints and seams are installed in the specified manner and tested for leakage where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Geosynthetics are placed and anchored as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	All appurtenances are installed at the location and in the manner specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Vents are installed where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	After placement, geosynthetics are covered in the manner specified to avoid lengthy UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Geosynthetics are not damaged during installation and covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11	Damaged geosynthetics are removed and replaced or repaired according to specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Materials—Geotextiles				
2.1	Verifying materials are approved for use by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Verifying delivered materials are protected by an intact manufacturer's protective cover.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Verifying the label information and the material conforms to the approved material submittal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Learning to identify various geotextile materials by look and feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Verifying the edges of woven geotextiles have a selvedge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
3. Storage and Handling—Geotextile				
3.1	Geotextile rolls are not damaged when moved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	The protective cover is not damaged when moved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Materials are stored in a dry shaded area away from damaging chemicals and excessive heat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Materials that are not protected from ultraviolet light exposure are not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Damaged materials are not incorporated into the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Geotextile that is stiff from being wet and freezing is thawed before installation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Surface Preparation—Geotextile				
4.1	The condition of the surface will not be detrimental to the function of the geotextile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Holes, rills, or other depressions are eliminated when necessary for the geotextile to function as intended.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Rocks, clods, roots, and sticks that could prevent geotextile from contacting the surface or could punch a hole in the fabric are removed or avoided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Muddy conditions, standing water, or flowing water are eliminated when necessary for the geotextile to function as intended.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	The foundation density complies with specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Placement—Geotextile				
5.1	The geotextile is in continuous contact with the foundation surface in all locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Joining of panels meets specification requirements for sewing or lapping as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Lap lengths are maintained after installation of cover materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Geotextile is not damaged during installation or covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Geotextile is properly anchored and secured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Geotextile is covered to the specified depth and within the specified timeframe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Cushioning of geotextile is provided where specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.8	Specified requirements for limiting vehicular and equipment traffic on the geotextile are followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

NEH 645 CL 10.2 Geomembranes Inspection Checklist

The following checklist provides guidance for inspection of the proper installation of geomembranes. This checklist does not address all of the conditions that may exist related to these installations and should be used for guidance only as the inspector examines the work. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections.

Project Name _____ Project no. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work inspected (include contract item number where applicable) _____

No.	Inspection item	Yes	No	N.A.
1. General				
1.1	Safe conditions exist when handling and installing geosynthetics.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Only approved materials are delivered and installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Materials are stored and handled properly and protected from UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	The subgrade or surface upon which geotextiles are to be installed complies with specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Joints and seams are installed in the specified manner and tested for leakage where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Geosynthetics are placed and anchored as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	All appurtenances are installed at the location and in the manner specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Vents are installed where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	After placement, geosynthetics are covered in the manner specified to avoid lengthy UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Geosynthetics are not damaged during installation and covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11	Damaged geosynthetics are removed and replaced or repaired according to specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Materials—Geomembranes				
2.1	All materials delivered to the site meet the contract requirements, including polymer type, thickness, and other properties, such as reinforcement, texturing, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Appropriate material certifications are provided, including roll number, manufacturer's quality control/quality assurance (MQC/MQA) test data and conformance test data, if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Quantities of all materials are sufficient to complete the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	All non-conforming materials are removed from the job site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
3. Storage and Handling—Geomembranes				
3.1	Materials are handled and stored according to the manufacturer's recommendations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Any damage occurring during off-loading or storage is noted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Damaged materials are repaired or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	All non-conforming materials are removed from the job site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Surgrade Preparation—Geomembranes				
4.1	Subgrade is free of harmful materials, including organics, sticks, rocks larger than 3/8 inch, angular rocks or other sharp objects, standing water, mud, or snow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Subgrade is smooth, firm, and unyielding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Surface deformations do not exceed 1 inch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Anchor Trench—Geomembranes				
5.1	Anchor trench is excavated as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Corners on the anchor trench are rounded and the walls are smooth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Backfill material for the anchor trench is as specified and that no unsuitable materials are present.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Anchor trench backfill material is compacted as specified without damage to geomembrane.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Liner Placement—Geomembranes				
6.1	Geomembrane placement does not begin until the subgrade has been approved by the engineer and a passing test strip has been performed by the installer, unless otherwise specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Weather conditions are suitable for geomembrane placement, according to the project specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Only approved materials are incorporated into the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	Placement procedures meet the project specifications and do not cause damage to the geomembrane or subgrade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	Defects, blemishes, or damage anywhere in the geomembrane panels are noted and marked for repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	Geomembrane is placed with the top side up in cases where top and bottom sides are designated by the manufacturer: for example, with some reinforced geomembranes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	Geomembrane is placed with adequate slack, but without significant wrinkles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	Minimum overlap is provided between adjacent geomembrane panels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.9	Temporary ballast is placed on the geomembrane to prevent displacement by wind during placement and at end of each day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.10	Traffic on the geomembrane is limited to the types of vehicles allowed in the project specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.11	An as-built sketch is maintained of all panels placed each day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Trial Seams—Geomembranes				
7.1	Trial seams are performed at the frequency specified in the project specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	All materials, methods, equipment, personnel, and conditions for the trial seam are the same as for production seaming.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Settings on welding machines are noted for later comparison with settings during production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	All required samples for testing are collected and labeled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
7.5	Samples are of the specified width and length.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	Samples are allowed to cure for the specified time period or cool to the specified temperature before testing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7	Samples are tested at the specified speed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.8	Testing equipment is calibrated as required by the project specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.9	Seam strengths for the trial seam meet the specified minimum values.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.10	Results of the seam strength tests are recorded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Seaming Methods—Geomembranes				
8.1	The correct seaming method for the liner material is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Seaming is not performed whenever the ambient sheet temperature is outside the specified range.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Seaming Procedures—Geomembranes				
9.1	The specified seaming method and equipment are being used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Generators (with adequate extension cords) are in place, fueled, and in good operating condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	All required materials and supplies are on hand in sufficient quantities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.4	The seaming equipment is calibrated as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.5	The installer has performed a passing trial seam at the specified frequency before production seaming.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.6	The seam overlap before seaming is dry and clean and that adequate overlap is provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.7	The seaming procedure is performed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.8	All seaming activities are documented, including weather, equipment or personnel problems, and any other factors affecting seam quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Repairs—Geomembranes				
10.1	All areas needing repair are identified and marked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Repairs are performed by the appropriate methods and by qualified personnel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	Areas to be repaired are cleaned and prepared as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.4	Repairs are tested by the appropriate methods of NDST and DST, as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.5	Repair activities are observed and documented, including on as-built sketches.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Appurtenances – Geomembranes				
11.1	All appurtenances are installed as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2	Specified materials are used for all pipes, boots, skirts, embed channels, batten strips, and fasteners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3	All NDST around appurtenances is observed and documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4	Thorough photo documentation is obtained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Covering (Soil Cover)—Geomembranes				
12.1	Cover soil meets the specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2	Minimum cover thickness is maintained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3	Specified equipment is used for placing and spreading operations and is operated as specified to avoid damaging the liner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.4	Cover soil is placed and spread such that damage to the liner is avoided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
12.5	Signs of possible damage to the liner are investigated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.6	Liner is covered within the maximum time period specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Covering (Concrete Cover)—Geomembranes				
13.1	Concrete cover is installed as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.2	Forms, reinforcing steel, and concrete are installed in the manner specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.3	Damage to the liner is noted and repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Non-Destructive Seam Testing—Geomembranes				
14.1	100 percent of the total seam length is tested by NDST methods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.2	Prescribed cooling or curing time is observed before NDST begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.3	NDST is performed according to the appropriate ASTM standard, using the specified equipment and procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.4	NDST is observed and the results documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.5	Defective or failed seams are marked for repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Destructive Seam Testing—Geomembranes				
15.1	Sampling locations for DST are selected and marked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.2	Samples for DST are taken at the specified frequency and location and meet the specified size requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.3	Sample information, including date, time, location, personnel, and equipment, is fully documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.4	Prescribed cooling or curing time is observed before performing any field testing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.5	Field testing is observed and the results documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.6	All parties doing testing receive the specified number of test specimens.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.7	All specimens are appropriately marked, prepared, and packaged for shipping to the testing locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.8	All specified tests are performed and reported.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.9	DST results are reviewed and appropriate follow-up made.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.10	Failing areas are positively bounded by obtaining passing tests in both directions from the failed area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

NEH 645 CL 10.3 Geosynthetic Clay Liner Inspection Checklist

The following checklist provides guidance for inspection of the proper installation of geosynthetic clay liners. This checklist does not address all of the conditions that may exist related to these installations and should be used for guidance only as the inspector examines the work. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections.

Project Name _____ Project no. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work inspected (include contract item number where applicable) _____

No.	Inspection item	Yes	No	N.A.
1. General				
1.1	Safe conditions exist when handling and installing geosynthetics.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Only approved materials are delivered and installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Materials are stored and handled properly and protected from UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	The subgrade or surface upon which geotextiles are to be installed complies with specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Joints and seams are installed in the specified manner and tested for leakage where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Geosynthetics are placed and anchored as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	All appurtenances are installed at the location and in the manner specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Vents are installed where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	After placement, geosynthetics are covered in the manner specified to avoid lengthy UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Geosynthetics are not damaged during installation and covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11	Damaged geosynthetics are removed and replaced or repaired according to specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Materials—Geomembranes				
2.1	All GCL materials and supplementary bentonite for seaming meet the contract requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Reinforced and non-reinforced GCLs are clearly identified and stored separately.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Specified materials are used for all pipes, collars, and other components.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Storage and Handling—Geosynthetic Clay Liners				
3.1	GCL materials are off-loaded and handled in a manner that prevents damage to the GCL and meets manufacturer's recommendations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
3.2	GCL materials are stored as recommended by the manufacturer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Any GCL materials that become damaged beyond repair are not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Surgrade Preparation—Geosynthetic Clay Liner				
4.1	Subgrade is smooth, dry, firm, and unyielding before deployment of the GCL liner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	All unsuitable materials have been removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	No projections greater than 0.5 inches are present.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Placement—Geosynthetic Clay Liners				
5.1	Proper placement techniques are used and panels are oriented as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	GCL is installed with the proper side against the subgrade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Non-reinforced GCL materials are installed only where specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Subgrade is not damaged during placement operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Sufficient overlap is provided at seams between adjacent GCL panels and that granular bentonite is applied to the overlap area at the specified rate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	The anchor trench is installed as shown on the drawings and the trench is backfilled and compacted as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Pipe penetrations and other appurtenances are installed as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Repairs—Geosynthetic Clay Liners				
6.1	All damaged areas are patched as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Minimum overlap is provided on all patches and granular bentonite is applied to the overlap at the specified rate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Covers and Protection—Geosynthetic Clay Liners				
7.1	Cover soil meets the specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Cover soil is placed to the minimum depth as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	At least 12 inches of cover soil is provided in all traffic areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Cover soil is compacted as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	Concrete is placed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Seam Testing—Geosynthetic Clay Liners				
8.1	There is not testing for geosynthetic clay liner seams.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

NEH 645 CL 11.1 Drains and Filters Inspection Checklist

The following checklist provides guidance for inspection of the proper installation of drains and filters. These systems are highly dependent on the material quality, storage and handling, placement, moisture content and compaction of the materials. This checklist does not address all of the conditions that may exist related to these installations and should be used for guidance only as the inspector examines the work. Inspectors should also use their own experience and knowledge for guidance on what to examine and look for during inspections.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work inspected (include contract item number where applicable) _____

No.	Inspection item	Yes	No	N.A.
1. Excavation safety				
1.1	The contractor has scouted the area for underground utility markers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	The landowner has been asked about possible underground utilities in the work area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	The contractor has notified the appropriate utility or “one-call” system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	The contractor is complying with the trench depth and sloping requirements of OSHA 1926.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Appropriate changes to depth and sloping requirements are made when soil or moisture conditions change.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Equipment and stored materials are being kept away from the trench walls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Trench shoring and bracing is complete before allowing personnel access to trenches.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Trench boxes are installed properly and workers are not working outside of the protective limits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Materials				
2.1	The gradation and soundness of the drainfill materials has been verified before delivery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	The drainfill materials are delivered from the approved sources.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Gradation tests are conducted on the drainfill materials in accordance with the specification requirements, contractor’s quality control plan, and NRCS quality assurance plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	The collector pipe meets all specification requirements for type, size and perforations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	The collector pipe is protected from excessive UV radiation during storage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	The geotextile meets all specification requirements and is protected from UV radiation during storage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
3. Base preparation				
3.1	Foundation surface and trenches are clean and free of organic matter, loose soil, foreign substances, and standing water when drainfill is placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Earth surfaces upon or against which drainfill will be placed have not been scarified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Storage and handling				
4.1	Materials remain uncontaminated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Materials are being handled in a manner that prevents segregation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Location and placement				
5.1	Work is not started until the specified foundation depths, lines, and grades are attained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Drainfill is not placed until the subgrade has been inspected and approved by the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Drainfill is not placed over or around pipe or drain tile until the installation of the pipe or tile has been inspected and approved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Drainfill is not placed in layers exceeding 12 inches thick before compaction or not more than 8 inches thick if manually controlled compaction equipment is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	The material is placed in a manner that does not cause segregation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	The material is placed in a manner that ensures continuity and integrity of zones.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Perforations of the collector pipe are correctly oriented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.8	Drainfill is not contaminated with foreign material during placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.9	Traffic is not allowed to cross over drains at random locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.10	Equipment crossovers are established and approved before beginning of drainfill placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.11	Crossovers are cleaned of all contaminated material and inspected by the engineer before placement of additional drainfill material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.12	Surface runoff is not allowed to enter the filter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.13	Any damage to the foundation surface or trench sides or bottom occurring during placement is repaired before drainfill placement is continued.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.14	The upper surface of drainfill constructed concurrently with adjacent zones of earthfill is maintained at a minimum elevation of 1 foot above the upper surface of adjacent earthfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.15	Drainfill over and around pipe or drain tile is placed to avoid any displacement in line or grade of the pipe or tile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.16	Drainfill is not placed adjacent to structures until the concrete has attained adequate strength as defined by the specification or approved by the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.17	Geotextile is placed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.18	Geotextile lap lengths meet specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.19	Soil surface is relatively smooth and free of protruding rocks and debris prior to placement of geotextile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.20	Damaged geotextile materials are repaired or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
6. Moisture control				
6.1	The moisture content of fine drainfill is appropriate for the method of compaction to be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Fine drainfill in the bulking moisture range is saturated and drained to break the capillary bonds.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	When additional water is required, it is applied in a manner to avoid excessive wetting to adjacent earthfill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Compaction				
7.1	Fine drainfill is compacted according to the method specified in the applicable specification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	The density of the drainfill material meets specification requirements or the specified compaction process is followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Heavy equipment is not operated within 2 feet of any structure and vibrating rollers are not operated within 5 feet of any structure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	There is no compaction by means of drop weights operating from cranes, hoists or similar equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

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NEH 645 CL 12.1 Concrete Checklist

This checklist provides guidance for examining the quality of concrete construction. It does not address all of the conditions that may exist related to concrete construction and lists some items that may not apply to the project at hand. It should be used for guidance only and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge of concrete for guidance on what to examine and look for during inspection.

Project Name _____ Project no. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

Inspector _____

Work Inspected _____

Work inspected (include contract item number where applicable) _____

No.	Inspection item	Yes	No	N.A.
1. Handling and Measurement of Materials				
1.1	Concrete mix is consistently uniform.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Any mix uniformity problems are investigated and corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Mix uniformity problems are documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	When batching on site, materials are handled properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	When batching on site, materials are accurately proportioned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	When batching on site, sequence in which materials are batched is consistent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	When batching on site, add water is adjusted to account for aggregate free-water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	When batching on site, if applicable, cementitious materials are not added until hot water has had a chance to cool.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	When batching on site, cementitious materials are kept dry until introduced into the mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	When batching on site, cementitious materials flow freely from the silo.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Forms				
2.1	Forms appear to be of good quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Forms are mortar-tight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Form surfaces (sheathing) are smooth and free of irregularities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Forms are properly installed and secured as designed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Forms are set to grade, positioned, and secured so that concrete is constructed within specified line and grade tolerances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Falsework appears adequate to support the forms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	Sheathing is oriented as designed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.8	Wales and studs or joists are installed in partially continuous spans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
2.9	Planned rate of placement will not exceed that used in the form design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.10	Forms and rate of placement are adjusted to account for cold weather, retarders, and superplasticized concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.11	Form release agents are used per manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.12	Form release agents are formulated for superplasticized concrete if applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.13	Bonding surfaces and smooth reinforcement are kept free from form release agents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.14	Any amount of form release agent more than a light film is removed from reinforcing bars.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.15	If specified, metal form ties contain cones, she bolts or other devices that allow for removal of the tie to a depth of at least one inch below the formed surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.16	If applicable, the specified size of chamfer strip is installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Preparation of Forms and Subgrade				
3.1	The subgrade and all embedments and reinforcing steel are clean and free of form oil and standing water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	All embedments are secured in the designed location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Metal embedments are nonferrous material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Vents are installed to avoid trapping air under large embedments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Foundation is not frozen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Foundation is moist and compacted as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	When specified, impermeable barriers are overlain with sand or geosynthetics that will allow the concrete to bleed downward.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.8	Rock foundations are clean and freed of loose material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.9	Rock foundations are free of negative slopes or overhangs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.10	Bonding surfaces are clean, free of form oil and curing compound.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.11	Bonding surfaces are treated as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Steel Reinforcement				
4.1	When delivered, steel is adequately bundled and tagged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Copies of all paperwork provided by the delivery driver are checked to verify it is the correct steel for the job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Steel is offloaded and stored in a manner that will allow it to remain free of mud or contaminants and will promote efficient extraction from the pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	The foundation is to specified grade and compacted to the specified density prior to steel placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Materials required to be placed between the slab and the earth are in place prior to steel placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	The correct size, shape, grade, and length of steel is placed and secured in the correct location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Splice lengths are adequate and appropriately located as specified or as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Bars are supported and secured so they do not move during concrete placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Conveying Concrete				
5.1	Concrete is conveyed to the point of placement within the allotted time and before it begins setting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Concrete quality has not suffered from too many drum revolutions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
5.3	Concrete that cannot be consolidated with an immersion vibrator is rejected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Concrete does not segregate when it is being conveyed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Concrete that is pumped has the specified air content and slump at the point of placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Concrete conveyed by conveyor belt is protected from sun and rain.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Placing Concrete				
6.1	When applicable, the placement plan is concurred in by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	The substrate, forms, reinforcement, and embedments are prepared, in the specified location, and secured ready for placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Bonding surfaces are prepared and treated as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	Bonding surfaces are clean and free of debris.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	Forms around large embedments are vented below the embedment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	All necessary equipment and labor needed to convey, consolidate, finish, cure, and protect the concrete is available before ordering concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	The approved job mix is delivered and specification compliant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	A copy of the delivery/batch ticket is retained for NRCS records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.9	No water is added in excess of that allowed by the approved job mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.10	Additives added on site are added with some water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.11	The mix is mixed a minimum of 30 revolutions at mixing speed after the addition of water or additives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.12	Efforts are made to determine that the concrete mix is specification compliant before it is placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.13	Test results taken for record documentation and those used as a basis for concrete rejection are taken from tests made on concrete sampled according to ASTM C172/C172M and tested according to the applicable test standard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.14	Drop heights and layer heights are limited to that specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.15	Lateral movement is limited after concrete is deposited.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.16	Every effort is made to limit cold joints.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.17	Bulkheads are installed and edge joints are formed and shaped when concreting is stopped for a significant length of time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Consolidating Concrete				
7.1	The method of consolidation is acceptable for the structure geometry and concrete mixture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Internal vibrators are the proper size.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Internal vibrators appear to be working properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	At least one backup vibrator and backup power source is readily available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	The vibrator operator appears to be operating the vibrator properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	The vibrator is withdrawn slowly and reinserted the proper distance from the last insertion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7	All of the concrete is vibrated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.8	The vibrator is inserted and extracted vertically.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.9	For thin slabs, the vibrator is fully immersed horizontally in the slab.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.10	The vibrator is not used to move concrete laterally.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
7.11	Large air bubbles cease appearing at the surface just before the vibrator is fully extracted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.12	All coarse aggregate is embedded below the surface after consolidation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.13	The consolidated concrete surface is near level with a thin film of glistening paste on the surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.14	Internal vibration is no longer permitted when a hole remains after the vibrator is extracted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Contraction Joints				
8.1	Joints are located at specified locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Timing of saw cutting results in a clean cut without raveling at the surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	Saw cutting does not occur so late that the concrete cracks ahead of the saw.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Contraction joints extend to a depth of one-fourth the slab thickness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5	Contraction joints extend to a depth less than one-third the slab thickness if load transfer from aggregate interlock is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Expansion Joints				
9.1	Joints are located at specified locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Expansion joint material is installed as shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	Expansion joint material is held firmly in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.4	Chamfer strips are installed if specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.5	When chamfer strips are not installed, the edge is formed or ground down so that it is not sharp and prone to chipping.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.6	Any mortar overlapping the joint material or any fins or wedges of concrete are removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.7	Reinforcing steel terminates on each side of the expansion joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.8	Dowel bars, when specified, are placed at the depth and location shown on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.9	Dowel bars are aligned with the axis of the structure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.10	Caps are placed on one end of each dowel bar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.11	A bond breaker is applied to the capped end of each dowel bar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.12	Joint sealants, when specified, are of the type specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.13	The backer rod is the proper diameter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.14	The backer rod is installed to the proper depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.15	The sealant bonding surface is clean and free of bond breaking substances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.16	The sealant is tooled to the required concave shape.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Construction Joints				
10.1	Joints are located at specified locations where applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Joints are cured until covered with fresh concrete or bonding agent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	Joints are prepared for bonding as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.4	Where a bonding agent is required, the bonding agent complies with specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.5	Where a bonding agent is required, the bonding agent is not too thick.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.6	Where a Portland cement based grout is used for a bonding agent, the grout is brushed into the surface of the existing concrete with a stiff-bristle brush.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.7	Concrete placed against the joint is adequately consolidated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
11. Waterstops				
11.1	The specified waterstops are installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2	Bentonite waterstops are not installed near the face of the concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3	Bentonite waterstops are kept dry until completely covered with concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4	The waterstop bulb is centered in the joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.5	Waterstops are centered in the slab or wall or located as otherwise specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.6	Corners and tees are fully welded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.7	Premolded corners and tees are used to aid in keeping the waterstop in position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.8	Welds are well bonded and appear not to weaken the waterstop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.9	Waterstops are secured in place and do not move during concrete placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.10	Waterstops are clean and not damaged during concrete placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Removal of Forms, Supports, and Protective Coverings				
12.1	Forms are carefully removed as soon as specifications allow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2	There is no measurable deflection or distortion of the concrete when removing supporting forms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3	Forms left on for curing are kept moist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.4	In cold weather, forms are removed in a manner to avoid thermal shock.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.5	Supporting forms are kept in place for the specified length of time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Finishing Formed Surfaces				
13.1	Line and grade are within specified or acceptable tolerances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.2	Defects are repaired and tie holes are filled ASAP.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.3	All form fins or burrs are ground off.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.4	Surface is finished as specified by rubbing or coating or both rubbing and coating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.5	Bug holes are filled with mortar prior to rubbing or coating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.6	Coatings are of the type and color approved by the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.7	The expiration date on the coating container is beyond the application date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.8	The mixing water used for coatings meets or exceeds the same requirements as the mixing water used to make the concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.9	Bonding agents are used with coatings as applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.10	Coating and bonding agents are applied according to manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.11	Curing compound is completely removed prior to applying bonding agents/coatings or curing compound is formulated for bonding surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Finishing Unformed Surfaces				
14.1	Finished grade is within specified or acceptable tolerances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.2	Only magnesium floats are used for air-entrained concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.3	After screeding, floating, and darbying no finishing operation occurs while bleed water is coming to the surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.4	The surface is finished as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.5	Curing begins immediately after finishing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Curing				
15.1	Curing begins as soon as practical after the concrete is finished.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.2	Immediately after placement, the concrete is cured for seven days or for the specified length of time at a concrete temperature at or above 50 °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
15.3	The curing period is extended if the concrete temperature drops below 50oF or is otherwise interrupted in order to cure the concrete for the specified amount of time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.4	Care is taken not to damage the concrete during the curing process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.5	New burlap is not used if staining of the concrete cannot be tolerated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.6	Coverings such as burlap, plastic, or curing paper are kept in intimate contact with the concrete surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.7	Coverings over soaker hoses are anchored with the edges firmly pressed against the concrete to limit air movement between the covering and the concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.8	When applicable, only the specified and approved type and class curing compound is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.9	Curing compound is applied with a continuously agitating sprayer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.10	Manual hand pump sprayers, brushes, or paint rollers are not used on areas over 400 square feet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.11	Timely uniform curing compound coverage is attained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.12	Any curing compound that gets on a bonding surface is removed prior to bonding with subsequently placed concrete or coatings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Curing				
16.1	New concrete is repaired as soon as possible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.2	Concrete needing repair is fully investigated to determine the extent of the area needing repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.3	The contractor's repair plan is concurred in by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.4	All damaged/non-compliant concrete is removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.5	If more than 50 percent of the reinforcing steel is exposed after concrete removal, the concrete is removed to a depth of at least three-quarters inch behind the steel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.6	Only approved methods are implemented when removing concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.7	Concrete removal methods do not damage the portion of the structure that is to remain in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.8	High-impact demolition equipment is not used to remove concrete unless approved by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.9	The repair cavity geometry complies with standards of best practice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.10	Rebar that has lost more than 25 percent of its original cross section is replaced or repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.11	Rebar is replaced or spliced with rebar of the same grade and size as that being spliced or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.12	Rebar laps and splices are of the specified length.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.13	Bonding surfaces are prepared as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.14	Bond enhancements are of the type and quality specified or otherwise approved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.15	Bonding agents are brushed into the bonding surface with a stiff-bristle brush.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.16	Bonding agents are covered with fresh concrete before they set.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.17	Safety concerns associated with repair products such as epoxies are addressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.18	The repair concrete mix has properties similar to the concrete being repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.19	The repair concrete mix is approved by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.20	The repair concrete quality is verified, where applicable, by batch ticket and tests for air content, slump, and temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.21	When specified, compressive strength specimens (cylinders) are made from a representative sample of the repair concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
16.22	Repair materials are cured as specified or recommended by the repair material manufacturer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Cold Weather Concreting				
17.1	Contractor's cold weather plan has been concurred in by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.2	Concrete is not ordered unless all systems and materials needed to implement the cold weather plan are on site and in good working order.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.3	Concrete is protected from freezing for 24 hours after placement, or longer if specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.4	Concrete is kept above 50 °F during the protection period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.5	Flatwork that remains wet is protected from freezing until it attains 3,500 pounds per square inch compressive strength.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.6	No more than 2 percent calcium chloride per 100 pounds of cement is added to the mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.7	Unless otherwise specified, calcium chloride is strictly not allowed in steel reinforced concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.8	Aggregates and water are not heated above the specified maximum temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.9	Except for sacrificial concrete, concrete is not placed on frozen subgrade or against forms that are 32 °F or colder.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.10	Concrete is not placed on subgrade that will settle an amount greater than that allowed by the design engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.11	Concrete is at or above the minimum specified temperature when placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.12	Concrete temperature does not exceed the minimum temperature given in table 12-6 by more than 20 °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.13	Where applicable, wells are formed to allow pocket thermometers to be inserted into the concrete after the concrete hardens.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.14	Accuracy of thermometers used to monitor concrete and air temperature is verified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.15	When verifying concrete is at or above the minimum specified temperature, temperature measurements are taken where the concrete is suspected to be the coldest.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.16	When monitoring temperature to access the potential for thermal shock, temperature measurements are taken where the concrete is suspected to be the warmest.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.17	Correct amount of installation is properly installed and maintained for the duration of the protection period or until other measures are in place to maintain the temperature within the specified range.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.18	Protection period is extended as necessary to gain the specified strength for concrete that is to be immediately put into service or otherwise loaded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.19	Heated enclosures are vented to prevent carbonization of the concrete and protect employees from carbon dioxide poisoning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.20	Attention is paid to curing, especially in heated enclosures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.21	Concrete is allowed to cool slowly at or below the specified maximum cooling rate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.22	Records of concreting in cold weather include all items that could help analyze deficiencies related to cold weather concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Concrete Acceptance				
18.1	Index tests and placement location are referenced to concrete cylinders.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.2	Cores are taken in the same concrete that produced failed concrete cylinders.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.3	Concrete dimensions and finish comply with specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**U.S. Department of Agriculture
Natural Resources Conservation Service**

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NEH 645 CL 13.1 RCC Construction Checklist

The following checklist provides guidance for examining the quality of RCC construction. The checklist does not address all of the conditions that may exist related to RCC construction. The checklist should be used for guidance only as the inspector examines the work, and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge of RCC and conventional concrete for guidance on what to examine and look for during inspections. Some items may not be listed. Some listed items may not apply to every project.

Project Name _____ Project No. _____

Location _____ Date _____

Field Inspector _____

Work Inspected _____

No.	Inspection item	Yes	No	NA
1. Materials				
1.1	Types of cement and pozzolan used in the RCC mix is in accordance with the job mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Temperature of cement and pozzolan at time of delivery is at or below the specified maximum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Cement and pozzolan are maintained in an uncontaminated dry condition..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Combined (coarse and fine) aggregate used in the mix is graded in accordance with the job mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Quality of the mix water complies with specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Admixture is in accordance with the job mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Mix design				
2.1	Mix proportions are in accordance with the job mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Other than minor reductions in water content, the job mix does not change without the engineer's concurrence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Test section				
3.1	Contractor's test section plan has been submitted and concurred with by the engineer prior to beginning the test section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Test section is constructed at the approved location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Approved job mix is the only mix placed in the test section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Production roller and special compaction equipment used in the test section meet specified requirements and are the same planned for use during RCC production.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Compaction equipment is operated at normal operating speeds.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
3. Test section—continued				
3.6	For soil foundations, a minimum of two 12-inch lifts are placed below the lift where the AMD is determined.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	TAFD is accurately determined for the field mix used in the test section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.8	Prior to determining the AMD, all RCC is compacted to a density equal to or greater than 96 percent of the TAFD.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.9	AMD is determined as per the process specified in Spec 3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.10	Any modifications to the job mix are concurred with by the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.11	After the AMD is determined, all RCC incorporated into the structure is compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.12	Air content and density of the mix are documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.13	Fifteen cylinders are made from the mix.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.14	Ten cores are made 13 days or more after the RCC is placed in the test section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.15	Curing is demonstrated to conform to Spec 36.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.16	If the test section is not incorporated into the structure, it is disposed of as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.17	All test section operations, including the pre- and post-test section briefings, are well documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Batching and mixing				
4.1	Plant operator's experience is documented and the operator exhibits the capability to oversee the batching and mixing operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Batching equipment is in good condition, has adequate capacity, and hoppers discharge completely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Drums are inspected and cleaned as needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Specified minimum quantities of aggregates are maintained on site during production.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Adequate quantities of all ingredients (aggregates, cement, pozzolan, water, and admixtures) are available on site to allow uninterrupted production.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Only nonsegregated aggregates are introduced into the mixer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Aggregate moisture is monitored and adjustments made to the mix at least once each shift or as needed to comply with job mix moisture requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Drum mixers are not overcharged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Transit mixers are not used for mixing RCC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10	Admixtures are metered at the specified rate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11	Plant operator visually inspects the mix for uniformity on a continuous basis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.12	Periodic visual inspections for mix uniformity are being made by quality control personnel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.13	Mix appears uniform or uniformity testing is conducted to verify uniformity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.14	Causes of uniformity are isolated and corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.15	Mix uniformity is documented periodically and before and after uniformity problems are corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Conveying				
5.1	Consistency or workability of RCC is maintained during conveyance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Belt conveyors are of ample width.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
5. Conveying—continued				
5.3	RCC mixture is protected during conveyance from excessive drying or rain.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Conveyor wipers and brushes are maintained in good working order.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Drop chutes of sufficient length and diameter are provided where necessary to prevent segregation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Free fall is limited to 5 feet or less.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Long, inclined chutes are not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.8	Hauling equipment does not contaminate or damage recently placed RCC surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.9	Conveyance time does not exceed the maximum specified time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.10	Critical conveyor components are accessible for machine removal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Wet Weather				
6.1	There is no mud or standing water on the bonding surface at the time of placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Placement ceases if changes in mix consistency indicate a significant increase in mix moisture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Unhardened RCC is protected from erosive high intensity rainfall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	RCC is not placed in rain falling at a rate equal to or greater than 0.1 inch in 20 minutes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Cold Weather				
7.1	RCC is not placed when the air temperature drops below 35 °F or the RCC mix is less than 40 °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	When there is potential for cold weather, all materials, labor, and equipment needed for adequate protection are on hand and ready for use prior to beginning placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	RCC temperature is maintained at or above 35 °F for a protection period equal to the curing period plus 7 days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Air and RCC temperatures are monitored and documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	When required by the specifications, the RCC is insulated if the air temperature is 25 °F cooler than that of the RCC during the protection period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	When specified, the RCC temperature does not drop more than 20 °F within the first 24 hours after insulation is removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Hot Weather				
8.1	If misters are used for cooling, a fine mist is used to avoid adding too much moisture to the fine aggregate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Mix placement temperature is monitored and documented and RCC is placed at a temperature at or below the maximum specified placement temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	All ice added for cooling is melted and distributed throughout the mix before being discharged from the tilting drum or compulsory mixer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Curing is begun immediately after compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Foundation preparation				
9.1	Foundation is excavated or filled to the specified lines and grades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Density of earthen foundation is uniform and meets specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	For rock foundations, all grouting is complete and surface irregularities are filled as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	NA
9. Foundation preparation—continued				
9.4	Rock foundations are clean.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.5	Foundation temperature is greater than or equal to 35 °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.6	Foundation is moist but free of standing water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Forming				
10.1	Forms conform to the plan for obtaining vertical surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Forms are set to the planned line and grade and are well anchored and braced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	Form oil is uniformly applied but not allowed to contact any bonding surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.4	Care is taken in the removal and resetting of forms to avoid damage to the previously placed RCC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Spacing and spreading				
11.1	Foundation or lift joint preparation is complete as specified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2	Forms are set to specified line and grade, well anchored, and oiled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3	Care is taken to prevent damage to previously placed RCC when setting forms or conducting other operational.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4	Lifts are of a uniform thickness to produce the designed grade within allowable tolerances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.5	Equipment does not contaminate or damage the lift surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.6	Mix is deposited away from forms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.7	Mix is deposited in a manner to limit segregation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.8	Mix is placed as near to its final location as possible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.9	Mix is spread quickly and in a manner to limit segregation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.10	Mix is placed in a configuration that limits edge joints.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.11	Segregated mix is remixed or wasted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.12	Tests are conducted to verify and document specification compliance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Compaction				
12.1	Production roller and special compaction equipment meet the specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2	Production roller is used where possible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3	Special compaction rollers are only used where absolutely necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.4	Lift thickness is controlled to prevent surface damage caused by over compacting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.5	RCC is compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.6	Requirement for uniformity of density is met.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.7	Compaction is accomplished as soon as possible after the RCC is placed, and within the specified time limit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Joints				
13.1	All transverse edge joints are spaced a minimum of 20 feet apart.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.2	All edge joints are trimmed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.3	All joints are treated as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.4	All joints are kept moist and clean.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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No.	Inspection item	Yes	No	NA
13. Joints—continued				
13.5	Specified neat cement grout or bonding mortar is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.6	Bonding materials are evenly distributed and spread to the specified thickness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.7	Bonding materials are not disturbed after placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.8	Bonding materials are not exposed longer than specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.9	Bonding materials do not set up or dry out before being covered with RCC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Curing				
14.1	Prior to beginning RCC placement, curing equipment and materials are onsite and ready to be deployed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.2	Curing begins immediately after compaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.3	Curing continues until the RCC has been maintained at or above 40 °F for 14 days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.4	Curing of repairs begins immediately after repair completion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.5	Repair curing continues until the repair has been maintained at or above 40 °F for 7 days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.6	Application of curing water does not erode the surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.7	Coverings are secured to prevent the movement of air between the RCC and the covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.8	Only white or reflective coverings are used during hot weather.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.9	Curing compounds are not applied to bonding surfaces or areas to be repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.10	Curing compounds conform to specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.11	Surface is kept continuously moist until the curing compound is applied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.12	All standing water is removed prior to applying the curing compound.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.13	Continuously agitating sprayers are used to apply curing compound.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.14	Manual hand pump sprayers are not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.15	Curing compound is reapplied every 7 days during the curing period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.16	Where curing compound is used, the entire surface is uniformly covered at the specified rate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Protection				
15.1	RCC is protected against erosive rainfall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.2	RCC is protected from cold weather damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.3	Vehicular traffic is prohibited if it causes damage to the RCC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.4	Form removal is accomplished without damage to the RCC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.5	Flows are diverted from the structure as needed to prevent damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

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NEH 645 CL 14.1 Shotcrete Checklist

This checklist provides guidance for examining the quality of shotcrete construction. It does not address all of the conditions that may exist related to shotcrete construction and lists some items that may not apply to the project at hand. It should be used for guidance only and should not be relied upon as a comprehensive list of items to check. Inspectors should also use their own experience and knowledge of shotcrete for guidance on what to examine and look for during inspection.

Project Name _____ Project No. _____

Location _____ Date _____

Work Period _____ A.M./P.M. to _____ A.M./P.M.

QA Inspector _____

QC Inspector _____

Work inspected (include contract item number where applicable) _____

No.	Inspection item	Yes	No	N.A.
1. Materials				
1.1	Water used in mixing and curing is clean and free from injurious amounts of oil, salt, acid, alkali, organic material, and other deleterious substances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Portland cement, aggregates, and admixtures meet the required specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Reinforcement is not too congested to inhibit placement and prevent the shotcrete from completely encasing the reinforcement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Nozzle Operator Qualifications				
2.1	Engineer has approved the resumé of the nozzle operator.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Engineer observes and approves the shooting of the test section or test panels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Equipment and Mixing				
3.1	The dry-mix shotcrete materials are mixed into a predampened homogeneous mass before being fed through a vibratory screen into the placing equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	The entire contents of the mixer are discharged before another batch is started.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	A mix that becomes difficult to pump is discarded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	A batch is gunned within 1.5 hours of being batched (normal weather) or 45 minutes (temperature over 85 °F).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Rebound material is not reused.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Air-entrainment and chemical admixtures are only used in wet-mix applications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	Wet-mix shotcrete is thoroughly mixed to produce a uniform mixture of the required consistency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Forms				
4.1	Forms are structurally adequate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Forms are designed such that rebound of accumulated loose aggregate can freely escape or be readily removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
4.3	Shooting strips are used at corners, edges, and on the surface where necessary to obtain true lines and proper thickness. (ACI 506R-16 defines these guide strips.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Guide wires are properly installed where necessary to control the surface or thickness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Header boards are installed where indicated on the drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Form surfaces are clean and a form release agent is applied before shotcrete is placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Preparation of Surfaces				
5.1	All surfaces to receive or support shotcrete have been adequately prepared and conditioned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	All prepared surfaces have been inspected by the engineer before application of shotcrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Earth surfaces have been firmly compacted and trimmed to line and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Concrete, mortar, or rock surfaces have been thoroughly cleaned by water blasting or sand blasting to remove all dirt, laitance, weak or unbonded mortar, loose material, grease, or other deleterious substances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Bonding surfaces are sufficiently rough to ensure adherence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Offsets that would cause an abrupt and substantial change in thickness of shotcrete have been removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Surfaces are maintained in a moistened condition for 3 hours prior to application of shotcrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.8	Shotcrete is not applied to mud, dried earth, uncompacted fill, rebound material, or surfaces having free water unless specifically authorized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.9	All ice, snow, and frost is removed prior to placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.10	All surfaces to be in contact with the new shotcrete are no cooler than 40 °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Placing				
6.1	The contractor has all equipment and material required for curing at the site and ready for use before placement begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	No shotcrete is placed except in the presence of the engineer or authorized representative.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Air pressure is adjusted during placement to control the rebound and density of shotcrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	For dry-mix applications, the air pressure and water pressure meet the minimum specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	Corners are filled first.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	Shotcrete is placed in a layer thickness no greater than that which will cause sagging, sloughing, or dropout.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	Sags and sloughs are cut out and replaced before previously place shotcrete has completely set.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	Vertical applications are started at the bottom and completed at the top.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.9	At any time that placement is interrupted for more than 1 hour, the edge of the layer must be shaped, protected, and conditioned prior resuming application, as required by the specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.10	Material that rebounds and accumulates on forms, steel, and other surfaces is removed prior to placement of shotcrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
7. Placing in Cold Weather				
7.1	Placement is not started unless the temperature is at least 40 °F and rising.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Placement is discontinued if the temperature falls below 40 °F and is expected to continue to fall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	The temperature of the shotcrete is not less than 50 °F when placing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	When the daily minimum temperature is less than 40 °F, the shotcrete must be insulated or housed and heated after placement and maintained at no less than 50 °F for the duration of the curing period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	Methods of insulating, housing and heating the structure comply with ACI 306.1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	Accelerators or antifreeze compounds are not used unless specifically authorized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7	When dry heat is used to protect shotcrete, an ambient humidity of 40 percent is maintained unless curing compound is applied or the shotcrete is covered tightly with an impervious material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.8	Removal of insulation or artificial heating is done such that there is not a rapid temperature drop, which could cause cracking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Placing in Hot Weather				
8.1	The temperature of the shotcrete is maintained below 90 °F during mixing, conveying, and placing using an approved method.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	The temperature of the aggregates or mixing water do not exceed 100 degrees Fahrenheit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	The temperature of the shotcrete does not exceed 90 °F during the curing period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Exposed shotcrete surface that is drying too rapidly is continuously moistened.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5	Surfaces exposed to air are covered and kept continuously wet for at least the first 24 hours and for the entire curing period unless an approved curing compound is applied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Replacement or Repair				
9.1	The engineer concurs in the extent of removal and replacement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	The engineer approved of the contractor's plan for making repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	Repair work is only completed in the presence of the engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.4	Reinforcement damaged during removal is replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.5	Sound shotcrete at the edges of the repair area are trimmed to expose sufficient reinforcement for competent repairs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.6	Sound shotcrete at the edges of the repair area are trimmed to a slope of 45 °F and moistened before new shotcrete is placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.7	The repair area is properly cured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Finishing				
10.1	Rebound material is promptly removed from finished surfaces before it becomes too hard to remove.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	The surface has been checked for low spots and repaired with additional shotcrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	The final surface is finished as per the requirements of the specification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.4	When screeding is specified, it is completed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Curing				
11.1	Shotcrete is prevented from drying for a curing period of at least 7 days after being placed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Inspection item	Yes	No	N.A.
11.2	Wood forms left in place during the curing period are kept wet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3	Formed surfaces are wetted immediately after form removal and kept wet until patching and repairs are completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4	The shotcrete surface is not damaged by applying water or covering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.5	Curing water is clear and free from substances that cause discoloration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.6	Curing compound is mixed and applied as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.7	Curing compound is not applied to the reinforcing steel or any surface that is to bond with subsequently placed shotcrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.8	Surfaces covered by a curing membrane that are subject to traffic are protected from damage or wear.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Preparing Test Panels				
12.1	Test panels are prepared in accordance with ASTM C1140.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2	Panels are a minimum of 18 inches square and 6 inches thick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3	Cores are cured as required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

[illegible]

NEH 645 CL 15.1 PIPE CHECKLIST

Project Name: _____

Project #: _____

Location: _____

Date: _____

Work Period: _____ A.M./P.M. to _____ A.M./P.M.

Field Inspector: _____

Work Inspected: _____

No.	Inspection Item	Yes	No	N.A.
1. Materials				
1.1	Pipe is of the specified size.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Pipe is of the specified type and class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Pipe is marked as required by the quality standard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Joint materials and pipeline appurtenances meet specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Damaged materials are rejected or are repaired if approved by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Repaired materials are repaired as specified and approved by the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Handling and Storage				
2.1	Trucks are unloaded on a level surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Care is taken when unloading to prevent uncontrolled movement of pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	When available, manufacturer's unloading recommendations are followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Nested pipe is removed or secured before unloading pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Proper lifting is employed to avoid damage to pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	The safe lifting load of equipment is not exceeded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	No one stands under or downslope from any item being lifted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.8	Care is taken when handling PVC pipe in cold weather.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.9	Pipe is stored in an accessible location near the installation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.10	Pipe markings and manufacturer's recommendations concerning storage are followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.11	Stacked pipe is secured during storage and removal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.12	Pipe is stored so that it can be removed as needed without having to move other pipe or materials out of the way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.13	Flexible pipe is uniformly supported and not stacked too high.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.14	Flexible pipe is not stacked over 2 feet high during prolonged storage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.15	Plastic pipe is protected from UV exposure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.16	Rigid pipe is supported in two places with equal load on each support.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.17	Pipe does not rest on flared bell.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.18	Pipe is handled with care to avoid damage to ends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Foundation and Bedding				
3.1	Rock, rocky soil, or extremely hard material is removed to the specified depth below the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Soft materials are removed to the specified depth below the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Foundation and bedding are compacted to the specified moisture-density requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Bedding is graded to the specified grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	When specified, bedding is shaped to conform to the pipe or shaped in a v-notch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Unexpected foundation materials are discussed with the responsible engineer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Laying Pipe				
4.1	Pipe, pipe joining materials, and appurtenances that are damaged are rejected or repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Pipe is lifted and conveyed in a safe manner that does not harm the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Uncontrolled rolling to convey pipe is prevented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Care is taken to avoid damage to pipe joints when joining pipes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Bedding is graded and uniformly compacted to the specified density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Pipe is fully supported without the use of mounds of soil, wood, concrete blocks, etc. under the pipe that could cause point-loading.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Bell ends are oriented upstream unless otherwise directed by the specifications or drawings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Holes are dug under flared bells to avoid resting the pipe on the bells.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Bevel-end pipe is placed in the proper sequence, oriented, and rotated as designated on the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10	Temporary concrete pipe supports (block or wedges) are made from the same concrete as that approved for the cradle or bedding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11	Blocks are shaped to cradle or conform to the bottom of the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.12	Concrete placed for bedding or for a cradle is well consolidated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.13	Concrete is deposited on both sides of the pipe, not moved from one side to the other with the aid of the vibrator.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.14	Installed pipe is protected from flooding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.15	The open ends of installed pipe are covered to keep out dirt and debris.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Solid Pipe Joints				
5.1 For heat-welded joints—				
5.11	If required, steel welds have been inspected and certified by a qualified inspector to meet specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.12	Steel pipe coatings are repaired if damaged by welding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.13	Specified steel pipe joint corrosion protection is properly installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 For solvent-welded and adhesive-bonded joints—				
5.21	The coupler, if used, is the proper size and of the same material as the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.22	Joining surfaces are cleaned and primed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.23	The correct type of solvent or adhesive is being used for the type of materials being welded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.24	The manufacturer-recommended amount of solvent or adhesive is applied to both surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.25	The pieces are twisted ¼ turn and allowed to rest the specified amount of time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 For heat-fused joints—				
5.31	Pipes to be fused are properly aligned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.32	Steel plate and pipe ends are clean and uncontaminated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.33	Steel plate adequately melts the pipe ends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.34	Ends are joined in a timely manner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Fixed Pipe Joints				
6.1 For tongue-and-groove joints that are to be watertight—				
6.11	Pipe is installed on a firm, uniform bedding resting on a stable foundation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.12	Pipes are aligned with a common axis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.13	With mortar sealing—			
6.131	Joining surfaces are clean and moistened.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.132	Applied mortar is fresh.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.133	Mortar sticks to and remains on the bonding surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.134	While pushing the pipes together, mortar exudes from around the full circumference of the inside and outside of the pipe joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.135	Excess mortar is removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.136	On the inside of the pipe, mortar is smoothed flush with the pipe wall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.137	Mortar is cured as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.138	Pipe is undisturbed until the mortar is fully cured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.14	With mastic or gasket sealing—			
6.141	Joining surfaces are clean and dry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.142	Gasket is the proper size for the pipe being joined.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.143	Mastic completely encircles the tongue with some overlap.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.144	Care is taken to ensure the mastic stays between the tongue and groove and does not fall out or become displaced as the pipes are pushed together.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.15	With rubber gasket sealing—			
6.151	Joining surfaces are clean and dry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.152	The correct gasket is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.153	The gasket and seating surface are lubricated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.154	The gasket remains in the desired location as the pipes are pushed together.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 For flanged joints—				
6.21	Flange mating surfaces and the gasket are clean at time of assembly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.22	Bolts, nuts, and washers are the correct size and specified grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.23	Gasket is installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.24	All bolts, nuts, and washers are installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.25	Nuts are tightened to the specified torque and in the sequence specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3 For mechanically coupled joints—				
6.31	With band couplers—			

6.311	Ends of pipes, the gasket, and the band coupler are clean.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.312	Gasket or o-rings are lubricated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.313	Gasket is positioned with equal parts covering each pipe end.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.314	O-rings are positioned in the pipe corrugations that are nearest to the outer grooves of the hugger-band.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.315	Corrugations align with those on the pipes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.316	Flanges are tightened to the specified torque.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.317	Encircling rods are installed and tightened to the specified torque or tightened so that the band coupler is snug around the joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 For articulating pipe joints—				
6.41	All joining surfaces are clean and free of debris.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.42	Any changes in pipe length from that specified is approved by the designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.43	Proper gasket is installed in the groove and lubricated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.44	The spigot is pushed home into the bell.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.45	Gasket remains in the gasket groove.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.46	Pipe is not damaged during assembly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.47	Pressure testing is conducted, if specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.48	Additionally, for steel cylinder concrete pressure pipe, the inspector must verify that—			
6.481	Joints are completely sealed with bituminous mastic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.482	Concrete is clean and, if specified by manufacturer, primed before installing mastic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.483	Mastic is covered with metal or fabric bands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.484	Fabric bands are added over metal bands if specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.485	Bands are secured tightly around the joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Embedment and Backfill				
7.1	Pipe is at the specified grade and alignment before beginning the embedment operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Embedment material does not contain rocks or soil clods in excess of the specified maximum size.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Embedment material completely fills the haunch area and is compacted to the specified density under the haunches.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Pipe is not displaced when compacting under the haunches.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	Care is taken when placing and compacting embedment material to avoid damage to the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	Embedment is placed and compacted to the minimum specified height.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7	There is no compaction immediately above the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.8	Heavy equipment is not operated within 2 feet of the pipe or within the specified distance from the pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

Comments: _____

NEH 645 CL 17.1 STREAMBANK SOIL BIOENGINEERING CHECKLIST

Project Name: _____ Project #: _____

Location: _____ Date: _____

Work Period: _____ A.M./P.M. to _____ A.M./P.M.

Field Inspector: _____

Work Inspected: _____

No.	Inspection Item	Yes	No	N.A.
1. Streambank Soil Bioengineering System Design				
1.1	Review available references to gain knowledge needed to understand SSB techniques and systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Consult with the responsible engineer to verify that proper techniques are planned and the planned location and extent of each technique within the system is deemed adequate to address the problem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Before construction begins, verify that someone has procured the necessary permits and land rights.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Verify the live material has been properly harvested, transported, stored, and prepared so that it remains alive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Verify provisions have been made for the maintenance that will be needed for adequate vegetative establishment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Materials				
2.1	Nonliving materials are of the specified type, grade, size, and quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Nonliving materials have been approved for incorporation into the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Only specified or approved plant species are used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Living materials are the specified diameter and length.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Living materials are healthy and undamaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Commercially sourced materials are used when gathering native plants is prohibited or the responsible engineer or other specialist has determined that locally sourced plant materials would adversely deplete local vegetation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	Rooted plants and vegetative cuttings are properly handled to avoid damage to plants or cuttings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.8	Vegetative cuttings have adequate stem length to allow for adequate stem cover and allow for cutting off the butt when damaged from driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.9	Appropriate supplemental irrigation is provided if specified in the design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Construction				
3.1	Natural or manufactured nonliving materials are installed as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Live materials are harvested and prepared as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Good soil-to-stem contact is maintained, and a portion of the stem remains in contact with saturated soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Care is taken to limit damage to cuttings when driving them into the ground.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	Cuttings are long enough to allow a portion of the butt to be cut off and to allow the basal (bottom) end to penetrate the water table the specified distance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

NEH 645 CL 18.1

PILE DRIVING CHECKLIST

Project Name: _____

Project #: _____

Location: _____

Date: _____

Work Period: _____ A.M./P.M. to _____ A.M./P.M.

Field Inspector: _____

Work Inspected: _____

No.	Inspection Item	Yes	No	N.A.
1. Materials				
1.1	Piles are checked as delivered and marked unacceptable if applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Pile dimensions and markings are correct.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Pile lengths are marked near the butt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Pile materials comply with specifications for the type of materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Piles designated for specific locations have the location printed near the butt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Butts are flat, smooth, and perpendicular to the long axis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Study manufacturer's brochures or pamphlets to become familiar with recommended methods of handling, inspecting, and driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Steel and Aluminum Pile Materials				
2.1	Materials are the approved grade and type.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Length, diameter or cross-sectional dimensions, weight and type of piles conform to specifications and approved submittals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Surface condition and condition of interlocks conform to drawings and specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	The condition of tip and butt reinforcing or shaping is as specified or noted on approved submittals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Bent or damaged flanges are rejected or properly repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Defective rivets or welds are rejected or repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	Splices, if allowed, exhibit good fit and quality workmanship.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.8	Piles made from short pieces are rejected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.9	Sheet-piling clutch shape and dimensions provide for a relatively tight interlock.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.10	Clutches are not damaged or deformed so as to prevent interlocking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Wooden Pile Materials				
3.1	Approved type of materials is delivered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Each pile is straight and properly dimensioned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Wood is free of decay, knots, splits, shakes, checks, crooks and bends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Tips and butts are properly prepared for driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	The wood is marked, as specified, to indicate that the specified type and amount of preservative has been applied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	All bark has been removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7	Damaged treated piling is rejected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.8	All cuts and breaks are treated with the specified type and amount of preservative.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.9	Sheet-piling meets all specified and approved requirements including tongue-and-groove geometry and dimensions, quality and suitability of materials for use as	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	piling, and designed dimensions.			
4. Precast Concrete Pile Casting				
4.1	Reinforcement is free from rust and scale and is properly positioned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Casting floor is level, flat, and firm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Pallet boards are of sufficient width to allow piles to be moved without damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	All cut ends of reinforcing tie wire are turned away from form surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	All inside surfaces of forms are smooth and clean.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Chamfer strips (if required or otherwise used) are in place and firmly attached to form.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Bracing and blocking between and around each piling are firm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Forms are level, straight, and watertight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Concrete mix conforms to the approved mix design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10	Concrete meets specified requirements for air, slump, and temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11	Concrete mix w/cm does not exceed the maximum stated in the approved mix design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.12	Concrete placing is continuous from start to finish to avoid cold joints.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.13	Top surface is leveled and finished to a uniform texture similar to that produced by the forms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.14	Concrete is cured as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.15	Each pile is stamped or marked near butt and tip to indicate length and manufacture date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.16	Lifting points are painted on each pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.17	Handling of pile is not permitted until the required strength has been attained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.18	Lifting cables are provided with a device to equalize the pull at all lifting points.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Precast Concrete Pile Materials				
5.1	For sheet-piling, tongue-and-groove interlocks are not chipped, cracked or broken.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Compressive strength test results show piles attained specified strength before moving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Piles are undamaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Piles are of uniform shape, true, and straight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Lifting cables are provided with some device to equalize the pull at all lifting points.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Warped, bent or broken piles are rejected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Piles are stored so that moving is minimized to limit damage potential.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Cast-in-place Pipe Materials				
6.1	Casings are marked or otherwise identified to conform with drawings and specifications and approved contractor material submittal documents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Reinforcing steel bundles are tagged and free from flaking rust.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Reinforcing steel conforms to drawings, specifications, and approved contractor material submittal documents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	Reinforcing steel is secured in place so that it remains in position as concrete is poured and consolidated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5	Reinforcing steel is clean and free of oil or other bond breaking substances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.6	The hole or casing is clean and free of standing water, debris, and soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7	Concrete mix conforms to the approved mix design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.8	Concrete meets specified requirements for air, slump, and temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.9	Compressive strength cylinders are made to document strength.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.10	Cylinders are made and cured near the cast-in-place piles when strength tests are needed to determine when the piles can be put into service.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.11	Concrete is well consolidated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Micropile Materials				
7.1	The casing pipe is of the correct diameter, wall thickness, and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	The correct welding procedure is used for welded joints of casing pipe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	For threaded joints of casing pipe, the threads are complete and undamaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4	Reinforcing steel is of the correct size and grade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5	The correct length of reinforcing steel is used in each micropile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6	The size and grade of the bearing plate is correct.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7	All nuts and couplers are of the correct size and material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.8	The approved grout mix is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Vinyl, FRP, Fiberglass, and Composite Pile Materials				
8.1	Materials conform to specified grade and type.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Materials conform to approved submittals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	Length, diameter or cross-sectional dimensions, weight, and type of piles conform to specifications and approved submittals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Surface condition conforms to material specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5	The condition of tip and butt reinforcing or shaping is as specified or noted on approved submittals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.6	Bent or damaged sections are rejected or properly repaired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Handling and Storage of Pile Materials				
9.1	Safe storage and handling methods are employed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Materials are not damaged in storage or by handling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3	Overhead utilities are avoided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.4	Marked lifting points are used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.5	Piles are blocked and braced to avoid falling or rolling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.6	Precast concrete piles are supported on blocks located at lifting points.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.7	Pile stack is orderly to avoid unnecessary moving or lifting of piles until they are needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.8	Fasteners, anchors, and appurtenances are kept clean, dry, and organized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Pile Driving Equipment				
10.1	Obtain and study the brochure printed by the hammer manufacturer in order to learn hammer capabilities and limitations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Pile driving equipment is stable and of adequate capacity to lift the pile and to control both the pile and hammer during the driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3	Contractor possesses current boiler inspection certificate and other safety requirements where steam or compressed air is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.4	The drive cap system allows the energy from the hammer to be efficiently transmitted to the pile without damaging it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.5	Cushioning material is of the proper strength, properly sized, and placed with the grain vertical.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.6	Cushioning material is replaced when compressed to one-half its original size or when it begins to smoke.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.7	Followers are used only when approved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.8	Double-acting hammers are operating at manufacturer's rated speeds.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.9	The condition of the hammer is being checked for wear, improper adjustment, poor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	lubrication, long hose lengths, and leaks and drops in steam or air pressure.			
10.10	Water jetting equipment is of the type recommended for the soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.11	Water flow is properly regulated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.12	Water jetting is not used for driving piles in coarse gravels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Bearing Capacity				
11.1	End-bearing piles are driven to the specified supporting strata, but not overdriven as to damage the pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2	Document test pile loading results whenever the test-pile method is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3	Document that all friction piles are driven to the depths determined from test-pile loading whenever the test pile method is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4	Verify that the required bearing capacity (R) is attained for each pile driven whenever the formula method is used by verifying—			
	– The hammer falls freely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– The head of the pile is not crushed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Penetration is reasonably quick and uniform.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– A follower is not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– “H” is reduced by twice the amount of any after-blow bounce.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– The proper bearing capacity formula is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.5	Document all field driving data and bearing capacity calculations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Preparing to Install Piles				
12.1	Verify coordination with utility company if utilities are present.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2	Review drawings, specifications, and pile driving plan to verify that all materials to be incorporated into the work have been approved and are available onsite before driving begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3	Determine if piles are to be driven to refusal, a specified depth, or a bearing capacity based on specified formula.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.4	Check boring logs to have some idea of the driving resistances and types of materials to be expected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.5	All excavation within the area to be occupied by bearing piles is complete before driving begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.6	Piles are not driven within 20 feet of concrete less than seven days old.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.7	Pile locations marked conform to drawings and pile driving plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.8	Length and size of each pile is checked against plan and schedule.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.9	Boiler certificate is obtained from contractor if steam is to be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.10	Verify engineer approval of jetting where jetting is planned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.11	Piles or leads are marked so that the penetration depth and rate can be determined quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.12	Verify the accuracy of pile schedule and lengths by—			
	– Driving several piles adjacent to or at boring locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Noting blows per foot of penetration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Comparing driving resistance with that anticipated from boring logs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.13	All equipment for performing required load tests, if applicable, is onsite in working order prior to installing test piles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Driving Piles				
13.1	Piles are handled properly and lifting points are used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.2	Piles are installed at planned location and driven vertically, or if battered, on the	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	axis they are to follow.			
13.3	Diameter and depth of pilot holes meets specifications and pile driving plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.4	Sequence of driving conforms to plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.5	Where friction piles are clustered together, inner piles are driven first.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.6	Record penetration of pile immediately after setting and prior to driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.7	Hammer is centered over the pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.8	When a template or timber bracing is used for guiding piles, check for sturdiness and elevation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.9	Check deviation from planned location and verify that any deviating pile is cut off, abandoned, or pulled and replaced with a new pile driven at planned location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.10	If jetting is used verify—			
	– Existing structures are not being damaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Previously driven piles are not being loosened.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Depth of jetting does not exceed permitted depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Pile remains plumb.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Piles are retapped after jetting in the area is completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.11	Pile driving is terminated if it becomes apparent that ground vibration may cause damage to adjacent structures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.12	Notify engineer of ground vibration concerns.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.13	Check the behavior of the pile during driving by—			
	– Comparing hardness of driving at various depths against that expected from boring logs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Watching for changes which indicate broken piles, obstructions, or driving irregularities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.14	Check when piles are driven in groups or clusters for heaving of the ground around the piles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.15	Pile driving is terminated if observed ground heave could damage any structure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.16	Notify engineer of heaving concerns.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.17	Check uplift on piles by measuring pile grade immediately after installation and recheck later.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.18	Each pile is driven to the specified minimum depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.19	End bearing piles are driven to the specified supporting strata by checking depths against boring logs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.20	Notify engineer of excessive hard driving or the presence of boulders, soft spots, old foundations, and other unfavorable conditions not shown on the drawings or otherwise expected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.21	When driving to refusal, verify that the number of blows per inch (or fraction of an inch penetration) does not exceed the specified blows per inch for the last 10 blows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.22	Whenever the formula method is specified—			
	– Verify the ram (hammer) is operating at full stroke, rated speed, and under full manufacturer's recommended pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Check any evidence of reduced hammer speed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Verify cushioning materials conform to resistance formula requirement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Verify the recording of readings taken immediately after resumption of driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Verify that driving ceases when the average penetration (S) equals the value obtained by the bearing capacity formula.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Verify the required bearing capacity (R) is attained for each pile driven.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.23	To prevent overdriving—			

	– Verify that contractor avoids overdriving when specific depths of penetration are unattainable due to some unforeseen underground condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Observe sound and any vibration of the pile during driving for evidence of overdriving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Watch for indications of overdriving such as bouncing of hammer; apparent loss of energy; bending, kinking, or butt damage of the pile, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– Check for signs of worn out or insufficient cushioning material during driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	– If allowed by specifications, pull an occasional pile to check for damage from overdriving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.24	Check workmanship, materials, and line and grade of completed work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.25	Permissible tolerances in alignment, plumbing, and grade are maintained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.26	Driving of each pile is continuous until required depth or penetration is attained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.27	If driving is suspended, note the tip grade at the time of the suspension and the duration of the delay.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.28	Approval is obtained for relocation of piles or driving additional piles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Driving Steel Piles				
14.1	Stiffening plates are installed on H-piles or I-piles if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.2	Wings are installed on wing piles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.3	Stiffening ring or steel shoe is installed on hollow steel piles where required or needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.4	External stiffening rings are not used on friction bearing piles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.5	Ends of hollow steel piles are closed when specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.6	Insides of open-ended piles are cleaned of soil, water, and debris before filling with concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.7	Damaged butts are cut off.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.8	Splices are made only when necessary and are reasonable in length.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.9	Cutoff elevations are within allowable tolerances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.10	For sheet pile, interlocking groove (clutch) matches with adjacent sheet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.11	Guide form is accurately located and secured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.12	Initial pile is accurately located, aligned, and plumbed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.13	Driving operations do not rupture sheet pile interlock.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.14	Splices are staggered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.15	Handling and pulling holes are provided if needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.16	Sheet-piling is left slightly higher than cutoff elevation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.17	Every tenth sheet pile is pinned to prevent “walking” and to maintain plumb.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.18	Waler installation will allow expansion and contraction of sheet-piling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.19	Caps are not placed on sheet-piling before bracing, welding, etc., is completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Driving Wooden Piles				
15.1	Tight steel or iron bands are installed around butt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.2	The butt is recut to remove unsound material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.3	Pile length will allow for cutting off the butt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.4	Holes in treated piles are filled with hot creosote or other approved material and, where not used, tightly closed by a treated plug.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.5	Holes are not bored nor spikes driven to support scaffolding in treated piles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.6	Shoes are used where needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.7	Painting of piles conforms to specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.8	Only approved materials are used for Wakefield piling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15.9	For Wakefield piling, tongue-and-groove dimensions and nailing or fastening provide for a secure tight fit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Driving Concrete Piles				
16.1	Specified lifting points are marked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.2	Piles are lifted at marked lifting points.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.3	Stacked piles are supported near lifting points.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.4	Notify engineer of mishandling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.5	Obtain approval from engineer to use mishandled piles before installing them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.6	Pile is equipped with proper driving shoe when necessary to guard against tip damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.7	Provisions are made for proper splicing and that splicing conforms to design and plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.8	Verify good alignment of spliced pile sections before continued driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.9	Warped, bent, or broken piles are rejected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.10	For concrete sheet-piling, tongue-and-groove interlocks are not chipped, cracked, or broken.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.11	For concrete sheet-piling, sheet-piling interlocks are fully grouted, if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Installing Cast-in-Place Piles				
17.1	Check the driven casing for ruptures and plumb before installing reinforcement or placing concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.2	The driven casing is thoroughly cleaned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.3	Check for ground heave and confer with the engineer when there is potential for problems related to ground heave.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.4	When a casing is not used, that the earth is moist, and that the integrity of the hole is maintained throughout the concrete pouring operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.5	Check the prepared pile hole before placing reinforcement, to verify full dimensions and to see that no swelling or movement of the soil occurs before placing concrete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.6	The casing or prepared pile hole is free of water before placing concrete if the concrete mixture is not designed for placing in water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.7	Reinforcing steel is rigidly assembled, lowered into the shell or unlined hole, and adequately secured in proper position throughout the concrete placement operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.8	There are no loose reinforcement bars.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.9	Reinforcement is clean.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.10	Approved concrete mix is used and it conforms to specifications for temperature, slump, and air content.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.11	Concrete is properly placed by pump or with a tremie to limit segregation potential.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.12	Concrete is placed and consolidated within the allotted time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.13	Concrete cylinders are made and handled as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.14	Concrete is consolidated by a method consistent with specified requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.15	Protection and curing of concrete is conducted as specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.16	The specified elapsed time after placing concrete has transpired before placing a load on the pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Installing Micropiles				
18.1	The contractor has proven specified-minimum-experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.2	The specified minimum hole diameter is maintained throughout the grouting operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.3	The centerline of the piling is where specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18.4	The pile is plumb to the degree specified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.5	The top elevation is within the allowable tolerance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.6	There are no observable signs of ground heave or subsidence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.7	The reinforcing steel surface is free of deleterious substances such as soil, mud, grease or oil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.8	The reinforcing steel is inserted to the desired depth without difficulty and not driven or forced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.9	Holes are re-drilled if necessary to allow the reinforcing steel to be inserted with ease.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.10	Centralizers or spacers, if used, are of allowable materials and spaced correctly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.11	Centralizers or spacers keep the reinforcement in place without greatly restricting the flow of grout.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.12	The horizontal position of the reinforcing steel is within allowable tolerance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.13	Micropiles are grouted the same day the holes are drilled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.14	The approved grout is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.15	The grout is well blended and free of lumps and undispersed cement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.16	The grouting equipment has the required pressure monitoring gauges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.17	The grouting pressure (if required) meets specification requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.18	The grout is kept in agitation prior to placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.19	The grout is placed within one hour of mixing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.20	Each micropile is grouted in one continuous operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.21	The tremie pipe or casing always extends below the level of the existing grout.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.22	Grout pressures are controlled to prevent excessive heave or fracturing of rock or soil formations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Driving vinyl, fiber-reinforced polymer, and aluminum sheet piles				
19.1	Verify accuracy of guide form alignment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.2	Verify accurate location, alignment, and plumb of initial pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.3	Every tenth sheet pile is checked for alignment, location, and plumb.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.4	Clutch matches and interlocks with adjacent pile.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.5	Driving operations do not rupture interlock.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.6	Piling is supported by a mandrel when necessary to prevent damage to the pile when driving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.7	Splices are staggered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.8	Sheet-piling is left slightly higher than cutoff elevation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.9	Walers are installed as specified at the specified elevation with the specified hardware.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.10	Waler installation will allow expansion and contraction of sheet-piling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Items that should be checked may not be listed. Items listed may not apply to every project.)

Comments: _____

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.