

Sampling and Testing Guide-Minimum Frequency

**STRUCTURAL CONCRETE, REINFORCEMENT, FOUNDATIONS & SUBSTRUCTURES,
CONCRETE STRUCTURES, CONCRETE FLOORS, AND CONCRETE BOX,
ARCH AND CIRCULAR CULVERTS**

Matls. IM 204
Appendix H (US) Units

Sections 2403, 2404, 2405, 2406, 2412, & 2415

April 19, 2005
Supercedes October 19, 2004

| MATERIAL OR CONSTRUCTION ITEM | TESTS | METHOD OF ACCEPTANCE & RELATED IMs | QC/ACCEPTANCE S&T | | | | | ASSURANCE, CORRELATION AND VERIFICATION S&T | | | | | REMARKS ➡➡ |
|--|------------|---|-------------------|-----------------|---|---------|--------|--|-----------|-------|-------------|---------|--|
| | | | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | REPORT | S&T TYPE | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | |
| SOURCE INSPECTION | | | | | | | | | | | | | |
| Aggregate-Fine (4110) | | AS 209 | | | | | | | | | | | |
| Aggregate-Coarse (4115) | | AS 209 | | | | | | | | | | | |
| Granular Backfill (4133) | | AS 209 | | | | | | | | | | | |
| Portland Cement (4101) | Quality | AS 401 | | | | | | | | | | | |
| Fly Ash (4108) | Quality | AS 491.17 | | | | | | | | | | | |
| Mixing Water (4102) | Quality | | RCE | ➡➡ 1/project | 1 L | CTRL | 731 | | | | | | Not required for potable water from Municipal Supply |
| GGBFS (Ground Granulated Blast Furnace Slag) | Quality | AS 491.14 | | | | | | | | | | | |
| Air Entraining Admixture | Quality | AB 403 | | | | | | | | | | | |
| Retarding Admixture | Quality | AB 403 | | | | | | | | | | | |
| Water reducing Admixture | Quality | AB 403 | | | | | | | | | | | |
| Curing Compound (4105) | Lab Tested | AB 405 ➡➡ | DME | 1/lot | 1 L | CTRL | | | | | | | Bridge Barrier Rails AASHTO, M148, Cert. by Manufacturer |
| AS-Approved Source AB-Approved Brand ASD-Approved Shop Drawing S&T-Sampling & Testing | | Cert A-Type A Certification Cert C-Type C Certification Cert D-Type D Certification | | | RCE-Resident Construction Engineer/Project Engineer DME-District Materials Engineer CTRL-Central Materials Office CONTR-Contractor | | | ASSUR-Independent Assurance VERIF-Verification CORR-Correlation MON-Monitor | | | | | |

Verification/Assurance samples not required when mix quantity is less than 50 cu. yd.

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| | | | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | REPORT | S&T TYPE | SAMPLE BY | FREQ. | SAMPL SIZE | TEST BY | | REPORT |
| SOURCE INSPECTION | | | | | | | | | | | | | | |
| Steel Masonry Plate (4152) | | AS Drawing/Cert A | | | | | | | | | | | | |
| Precast Units (2407) | Quality | AS 570 | | | | | | | | | | | | |
| Anchor Bolts (lighting, signing, handrail) (4153) | Lab Tested | ASD | | | | | | | | | | | | |
| Structural Steel (4152) | Quality | ➡➡ Cert A | | | | | | | | | | | | Monitor Sample According to plans or other instructions |
| Aluminum Bridge Rail & Anchor Assembly | | ASD | | | | | | | | | | | | |
| Conduit (Electrical) (4185.10) Steel | | AB | | | | | | | | | | | | |
| Conduit (Plastic) (4185.10) | Lab Tested | | DME | 1/size | 4' | CTRL | | | | | | | | |
| Bentonite | | AS Cert D | | | | | | | | | | | | |
| Flowable Mortar | Lab Tested ➡➡ | Approved Trial Mix 525, 375 | | | | | | | | | | | | Tested by DME |
| AS-Approved Source AB-Approved Brand ASD-Approved Shop Drawing S&T-Sampling & Testing | | Cert A-Type A Certification Cert C-Type C Certification Cert D-Type D Certification | | | | | RCE-Resident Construction Engineer/Project Engineer DME-District Materials Engineer CTRL-Central Materials Office CONTR-Contractor | | | | | | | ASSUR-Independent Assurance VERIF-Verification CORR-Correlation MON-Monitor |

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|-------------------------------|-----------|------------------------------------|-------------------|---|-------------|---------|--------|---|------------|---|---|------------------|---------------|--------------------------------------|----------------------------|
| | | | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | REPORT | S&T TYPE | SAMPLE BY | FREQ. | SAMPL E SIZE | TEST BY | | REPORT | |
| PLANT INSPECTION | | | | | | | | | | | | | | | |
| Aggregate- Fine (4110) | Gradation | 302, 306 336 | CONTR | 3/lot | IM 301 | CONTR | 800240 | ASSUR CORR | DME CONTR | 1/1000 cy➡➡ 1 st day +10% | IM 301 IM 301 | DME RCE | | System Approach Applicable | |
| | Moisture | ➡➡ 308, 528 | CONTR | 1/lot | 1000 gm | CONTR | | | | | | | | See IM 528 if Moisture Probe is used | |
| | Sp. Gr. | 307 | CONTR | IM 528 | 1000 gm | CONTR | | | | | | | | | |
| | Quality | AS 209 | | | | | | | | | | | | | |
| Aggregate- Coarse (4115) | Gradation | 302, 306 336 | CONTR | 3/lot | IM 301 | CONTR | | | ASSUR CORR | DME CONTR | ➡➡ 1/1000 CY 1 st day+10% | IM 301 IM 301 | DME RCE | | System Approach Applicable |
| | Moisture | 308, 528 | CONTR | 1/lot | 2000gm | CONTR | | | | | | | | | |
| | Sp. Gr. | 307 | CONTR | IM 528 | 2000gm | CONTR | | | | | | | | | |
| | Quality | AS 209 | | | | | | | V | DME | 1/1000 cy | 50 lb | CTRL | | |
| Portland Cement | w/c ratio | 528 | CONTR | 1/pour | | CONTR | | | | | | | | | |
| | Quality | AS Cert D | | | | | | | V | DME | 1/1000 cy | 15 lb | CTRL | | |
| AS-Approved Source | | Cert A-Type A Certification | | RCE-Resident Construction Engineer/Project Engineer | | | | ASSUR-Independent Assurance | | | | | | | |
| AB-Approved Brand | | Cert C-Type C Certification | | DME-District Materials Engineer | | | | VERIF-Verification | | | | | | | |
| ASD-Approved Shop Drawing | | Cert D-Type D Certification | | CTRL-Central Materials Office | | | | CORR-Correlation | | | | | | | |
| S&T-Sampling & Testing | | | | CONTR-Contractor | | | | MON-Monitor | | | | | | | |

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|---|-------------|------------------------------------|---------------|------------------------------------|----------------|-------------|---------|-----------------------------|---|-----------|-----------------|-------------|--------------|---|
| | | | | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | REPORT | S&T TYPE | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | |
| PLANT INSPECTION | | | | | | | | | | | | | | |
| Fly Ash | Quality | AS | Cert D | | Each Load | | | 800240 | | | | | | |
| GGBFS(Ground Granulated Blast Furnace Slag) | Quality | AS | Cert D | | Each Load | | | | | | | | | |
| Air-Entraining Admixture (4103) | | AB | 403 | RCE | 1/lot➡➡ | 0.5 L | CTRL | | | | | | | Sample lots not previously reported or as required by DME |
| Retarding Admixture | | AB | 403 | RCE | 1/lot➡➡ | 0.5 L | CTRL | | | | | | | |
| Water Reducing Admixture (4103) | | AB | 403 | RCE | 1/lot➡➡ | 0.5 L | CTRL | | | | | | | |
| GRADE INSPECTION | | | | | | | | | | | | | | |
| Plastic Concrete | Air Content | | 316, 327 | RCE | 1/30 cy➡➡ | | RCE | E145* | ASSUR | DME | 1/1000 cy | | DME | DME may adjust |
| | Slump | | 317, 327 | RCE | 1/30 cy ➡➡ | | RCE | | ASSUR | DME | 1/1000 cy | | Witness Only | DME may adjust |
| | Beams | | 316, 327, 328 | RCE | 2/placement ➡➡ | | RCE | | | | | | | If required per 2403.18 and 2403.19 |
| | Cylinders | | | | | | | | DME | | ➡➡ 3/project | | DME | Primary Projects Only (Information only) |
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*Available from the Office of Construction.

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| | | | | SAMPLE BY | FREQ. | SAMPLE SIZE | TES BY | REPORT | S&T TYPE | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | |
| GRADE INSPECTION | | | | | | | | | | | | | | |
| Reinforcing Steel (4151) | Quality | AS | Cert A | | Each Shipment | | | Field Book | V | DME | IM 451 | 6 ft | CTRL | |
| Reinforcing Steel Epoxy Coated (4151) | Quality | AS | Cert A | | Each Shipment | | | Field Book | V ➡ | DME | 1 of largest bar in deck | 6 ft | CTRL | Will be acceptance tested for coating |
| Steel Pile (4167) | Quality | AS | Cert A | | Each Heat | | | Field Book | | DME | IM 467 | | CTRL | Monitor by CTRL Materials |
| Timber Pile (4165) | Quality | Cert D | 462 | | | | | | MON | | | | | Test report by Independent Lab |
| Anchor Bolts (lighting, signing, handrail) | Lab Tested | ASD | | DME | ➡ 1/project | 1 bolt w/nut & washer | CTRL | | | | | | | Sample only if not source inspected |
| Steel Masonry Plates (4152) | | ASD | Cert A | | Each Shipment | | | Field Book | | | | | | Approved by Materials Department |
| Bronze Bearing Plates (4190.03) | Lab Tested | | | DME | ➡ 1/project | 1 only | CTRL | | | | | | | Sample only if not source inspected |
| Neoprene Bearing Pads (4195) | | AS | 495.03 | | Each Shipment | | | 820905 | | | | | | |
| Alum. Bridge Rail & Anchor Assembly | | ASD | | | Each Shipment | | | Field Book | | | | | | Approved By Materials Dept. |
| Drains (Std Steel Pipe)(as per plan) | Dimensions Galvanized | ASD | Visual 332 | DME | 1/project | | DME | Test Report | | | | | | |
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| | | | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | REPORT | S&T TYPE | SAMPLE BY | FREQ. | SAMPLE SIZE | TEST BY | | REPORT |
| GRADE INSPECTION | | | | | | | | | | | | | | |
| Timber (4162) & Lumber (4163) | Quality | Cert D 4162 | | Each Shipment | | | | | | | | | | |
| Subdrain Pipe (4143) | Quality | AS Cert D 443, 448 | | Each Shipment | | | | | | | | | | |
| Flowable Mortar (2506) ➡➡ | Flow Test | 375 | RCE | As needed for Project Control | | RCE | 830211 | | | | | | | Mix Design approval by DME |
| Bentonite | Flow Test | Visual 375 | | | | RCE | | | | | | | | |
| Smoothness (2317) | Profilometer | Cert. Test Report 341 | CONTR | Each Project | Each Wheelpath | CONTR | 821301 | CORR | DME | 10% | | | | |
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