Concrete Industry in NYC

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NYC Buildings

Investigative Engineering Services

- ❑ Forensic Engineering Unit
- ❑ Concrete Enforcement Unit
- ❑ Facade and Local Law Unit
- ❑ Retaining Walls
- ❑ Compromised Buildings

Concrete Enforcement Unit

Description

- Legislative Unit
- Enforcement in all five boroughs
- Unit comprised of specially trained Inspectors, Engineers and Administrators
- All Inspectors and Engineers are ACI certified

Concrete Enforcement Unit

Description

- Number of annual inspections in 2014 = 2,064
- Projected number of annual inspections in 2015 = 3,000
- Number of annual drawing audits in 2014 = 135
- Projected number of annual drawing audits in 2015 = 400

Concrete Enforcement Unit

Legislative Responsibilities

Field Inspections

- ❑ Structural inspections and site safety inspections of all buildings nine stories and under
- ❑ Structural inspections of all buildings ten stories and up (BEST responsible for site safety of Major Buildings)
- ❑ Parallel Testing – compressive cylinders taken on site and tested at Port Authority Lab. CEU Engineers compare test results from PA with testing lab results
- ❑ TR-2/ TR-3 forms, referrals from industry and other DOB Units (Best, Excavation/Foundation)

Concrete Enforcement Unit

Legislative Responsibilities

Concrete Lab Inspections

- ❑ Random twice annual inspections of all NYC registered concrete testing labs
- ❑ Review Labs records for equipment calibration
- ❑ Witness a compression test
- ❑ Inspect that concrete cylinder are stored properly

Concrete Enforcement Unit

Legislative Responsibilities

Engineering Audits

- ❑ Review of Structural and Architectural Drawings
- ❑ Pre-permit reviews
- ❑ Post-permit reviews

Concrete Enforcement Unit

Legislative Responsibilities

Incident Response

- ❑ Formwork failures
- ❑ Concrete Pump/Hose malfunctions
- ❑ Concrete truck accidents

Concrete Enforcement Unit

Engineering Audit

Engineering Design

- ❑ Lateral system incomplete or no lateral system. Building serviceability
- ❑ Building Separation
- ❑ Under designed structural elements; cantilevers and transfer beams

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Engineering Audit

Engineering Design Resolution W/O Construction

- ❑ CEU provides drawing objection list.
- ❑ EOR + CEU Engineers meet to discuss objection list and course of action.
- ❑ EOR revises drawings as required and submits drawings to CEU for review and approval.
- ❑ Upon approval CEU issues full rescind of associated CEU SWO.
- ❑ EOR submits PAA.

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Engineering Audit

Engineering Design Resolution W/Construction

- ❑ CEU provides drawing objection list.
- ❑ EOR, Owner and CEU Engineers meet to discuss objection list and course of action.
- ❑ Owner to make decision between repairs and removal.
- ❑ EOR revises drawings as required.
- ❑ Revised drawings and Special Inspector reports are submitted to CEU for review and approval.

Concrete Enforcement Unit

Engineering Audit

Engineering Design Resolution W/Construction

Contd….

- ❑ CEU issues partial rescind of SWO to allow all repairs to be completed.
- ❑ EOR and Special Inspector provides certification that all repairs have been completed as per approved drawings.
- ❑ CEU inspection to confirm repairs completed.
- ❑ CEU issues full rescind of associated CEU SWO.
- ❑ EOR submits PAA.

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Engineering Audit

Special Inspections

- ❑ Incomplete TR-1 form. Complete lack of special inspections
- ❑ Partial Inspections. Special Inspector not inspecting entire structure

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Engineering Audit

Special Inspection Resolution

- ❑ EOR to prepare and submit to CEU for approval a proposed testing program in order to verify completed construction.
- ❑ Review and approval of proposed testing program by CEU.
- ❑ Upon approval CEU will provide partial rescind of SWO to allow specified testing to occur on site.
- ❑ Owner to perform testing program.
- ❑ EOR to review results of testing program and confirm compliance with reviewed permitted drawings and submits engineer report and any necessary repair by CEU.

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Engineering Audit

Special Inspection Resolution

Contd…….

- ❑ Review and approval of engineering report and any necessary repairs by CEU.
- ❑ Upon approval CEU will provide partial rescind of SWO to allow necessary repairs.
- ❑ Owner perform necessary repair.
- ❑ CEU inspects to confirm repairs were completed.
- ❑ CEU issue full rescind of SWO.
- ❑ EOR issues PAA with necessary repairs included.

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Engineering Audit

<u>Concrete operations/Construction</u>

- ❑ Design Documents are correct, construction contrary to approved plans
- ❑ Errors with major structural elements

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Engineering Audit

Concrete operations/Construction resolutions

- ❑ CEU Engineers identify areas of concern.
- ❑ EOR performs full site assessment.
- ❑ Special Inspector performs full site inspection.
- ❑ EOR must address all issues that arise from both site visits.
- ❑ Owner directs EOR to revise permitted drawings to reflect as built conditions including necessary modifications/repairs/reinforcement along with methodology for repairs.
- ❑ Revised drawings of special inspection reports are submitted to CEU for review and approval.

Concrete Enforcement Unit

Engineering Audit

Concrete operations/Construction resolutions

Contd……

- ❑ CEU issues partial rescind of SWO to allow all repairs to be completed.
- ❑ EOR and Special Inspector provide certification that all repairs have been completed as per approval drawings.
- ❑ CEU inspection to confirm repairs completed.
- ❑ CEU issues full rescind of associated CEU SWO.
- ❑ EOR submits PAA.

Concrete – Special Inspections BC 1704.4

BC 1704.4 Concrete Construction

Special Inspections for Concrete Construction is required except:

- ❑ Nonstructural concrete slabs on grade
- ❑ Concrete foundation for lightweight fences and recreational equipment
- ❑ Concrete patios, site furnishings, garden walls, driveways, sidewalks and similar construction.

Concrete – Special Inspections BC 1704.4

BC 1704.4 Concrete Construction

Testing of Concrete Construction at the time fresh concrete is required except:

- ❑ Where total concrete placement on a given project is less than 50 cubic yards.
- ❑ Isolated spread footings of 1 or 2 family buildings three stories or less supported on earth or rock.
- ❑ Continuous concrete spread footings supporting walls of 1 or 2 family buildings three stories or less supporting on earth or rock.

BC 3305.3.2.1: Formwork - New Design Triggers

3305.3.2.1 Design drawings. (New Design Triggers)

1. For concrete formwork is in a structure classified as a major building; *or*
6. Wherever the slab thicknesses or beam heights equal or exceed 10 inches; *or*
7. Wherever there are concentrated loads exceeding 2000 lbs. imposed on the formwork; *or*
8. Wherever there are loads imposed on existing structures in accordance with Section 3305.3.1.2.1.

BC 3305.3.2.1: Formwork – 2008 NYCBC Design

Triggers incorporated into 2014 NYCBC CODE

3305.3.2.1 Design drawings. (Existing Design Triggers)

2. Wherever the shore or form height exceed 14 feet; or
3. Wherever the total vertical load on the forms exceed 150 pounds per square foot; or
4. Wherever power buggies are used; or
5. Wherever multi-stage shores are used.

Note: In 2008 NYCBC these design triggers were located in Chapter 19 (Concrete) section 1906.3 Design of Concrete Formwork.

BC 3305.3.1.2.1: Concrete Load On Existing Structures

3305.3.1.2.1 Use of existing structures to support vertical or lateral loads.

The use of existing structures to support vertical or lateral loads imposed by concrete construction operations shall require an evaluation of the existing structure for the loads imposed by a registered design professional. The registered design professional shall prepare design drawings documenting the findings of the evaluation, indicate the location of formwork elements, and the interface between the formwork and the existing structure.

BC 3305.3.3.2: Form Work Observation

3305.3.3.2 Formwork observation.

In addition to the inspections by the contractor required pursuant to Section 3305.3.3.1, visual observations of the formwork for the general conformance with the design intent shall be performed by the formwork designer or his designee.

BC 3305.3.4.5: Perimeter Form work

3305.3.4.5 Perimeter formwork. Horizontal formwork deck panels and beam for formwork within 16 feet (4877 mm) from the building perimeter shall be positively attached to all formwork support systems at a minimum.

BC 3305.3.6.8: Concrete Formwork Reshoring

3305.3.6.8 Reshoring Schedule.

A signed and sealed reshoring schedule shall be provided and maintained at the construction site whenever reshoring is employed.

Exception:

A separate reshoring schedule is not required when the required reshoring information is covered on the approved construction documents prepared by the applicant of record.

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Field Inspection – BC 1906.3.2

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Field Inspection – BC 1906.3.2

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Field Inspection – BC 1704.4 – BC 1905.7

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Field Inspection – BC 1905.6.3.2

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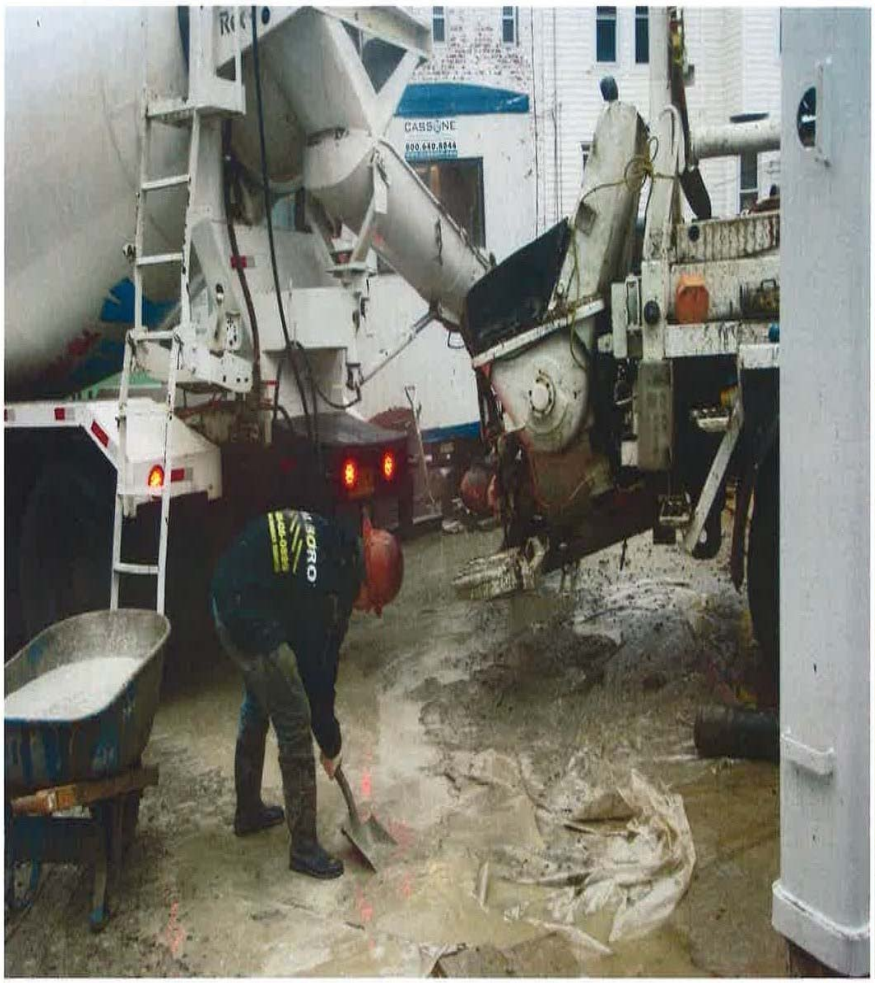
Field Inspection – BC 3303.15.1



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Field Inspection – BC 3301.7

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Field Inspection – BC 28 - 105.12.2

Concrete Enforcement Unit

Field Inspection – BC 3301.2

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Field Inspection – BC 3307.3.1

Concrete Enforcement Unit

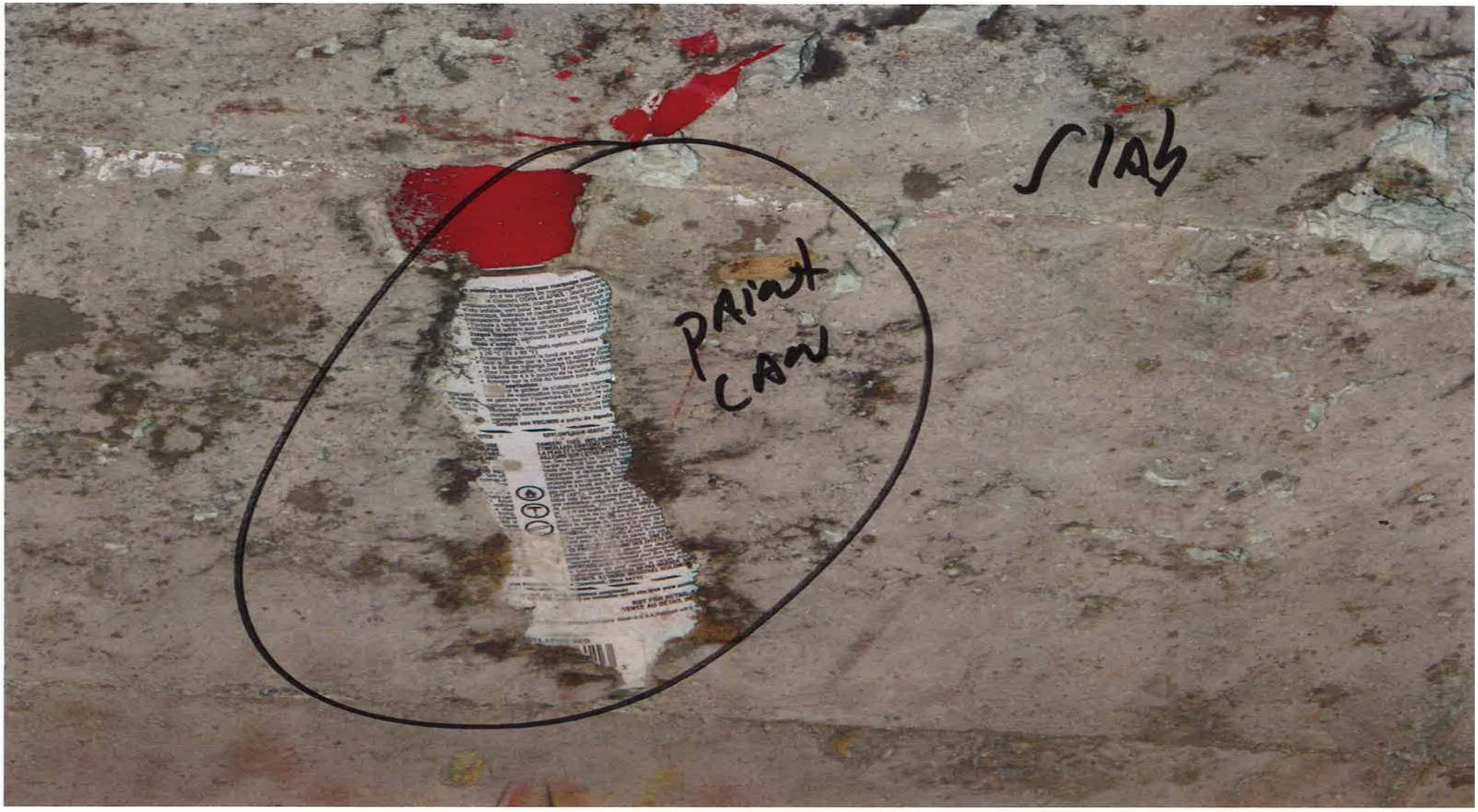
Field Inspection – BC 28-105.12.2

Concrete Enforcement Unit

Field Inspection – BC 3301.7

Concrete Enforcement Unit

Field Inspection – BC 3301.7



Concrete Enforcement Unit

Field Inspection – BC3301.7

Concrete Enforcement Unit

Field Inspection – BC 28.105.12.2

Concrete Enforcement Unit

Field Inspection - BC 28-104.7

Concrete Enforcement Unit

Field Inspection - BC 28-105.12.2

Concrete Enforcement Unit

Field Inspection - BC 28-105.12.2

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Field Inspection – BC 3301.7

Concrete Enforcement Unit

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Field Inspection - BC 28-105.12.2

Concrete Enforcement Unit

Field Inspection - BC 3301.7

Concrete Enforcement Unit

Field Inspection - BC 2205.1

Concrete Enforcement Unit

Field Inspection - BC 2104.6

Concrete Enforcement Unit

Field Inspection - BC 2104.6

Concrete Enforcement Unit

Field Inspection – BC 28-105.12.2