

Environment Act Proposal Form



Name of the development: MFESRA B5 Contract Portion for New All Seasons Road	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class 1 Development	
Legal name of the applicant: Innovative Civil Constructors Inc.	
Mailing address of the applicant: 5795 Don Murie St	
Contact Person: Mario Martin	
City: Niagara Falls	Province: ON
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Location of the development: East side of Road at Station 151.000 New All Seasons Road MFESRA	
Contact Person: Richard Gemmell	
Street Address: n/a	
Legal Description: SE ¼ Sec 24 Twp 038 Rge 004 E1 (permit # CQP-2015-1007088) SW ¼ Sec 19 Twp 038 RGE 005 E1 (permit # CQP-2015-1007087)	
City/Town: n/a	Province: MB
Postal Code: n/a	
Phone Number: 905 536-5698	Fax: email: rick.gemmell@ic2i.ca
Name of proponent contact person for purposes of the environmental assessment: Richard Gemmell	
Phone: 905 536-5698	Mailing address: 5795 Don Murie St Niagara Falls ON L2G 0A9
Fax:	
Email address: rick.gemmell@ic2i.ca	
Webpage address: www.ic2i.ca	
Date: July 28, 2015	Signature of proponent, or corporate principal of corporate proponent:
	Printed name:

A complete **Environment Act Proposal (EAP)** consists of the following components:

- **Cover letter**
- **Environment Act Proposal Form**
- **Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information and number of copies)
- **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):	
Class 1 Developments	\$1,000
Class 2 Developments	\$7,500
Class 3 Developments:	
Transportation and Transmission Lines ..	\$10,000
Water Developments	\$60,000
Energy and Mining.....	\$120,000

Submit the complete EAP to:

Director
Environmental Approvals Branch
Manitoba Conservation and Water Stewardship
Suite 160, 123 Main Street
Winnipeg, Manitoba R3C 1A5

For more information:

Phone: (204) 945-8321

Fax: (204) 945-5229

<http://www.gov.mb.ca/conservation/eal>

Environmental Act Proposal

Requesting License to Operate Mobile Concrete Batch Plant

New All Season Road

Manitoba Floodway East Side Road Authority

B5 Contract – Pigeon River Bridge

Class 1 Development



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Executive Summary

Innovative Civil Constructors Inc. (ICCI) has been operating a portable concrete products batch plant for in various provinces in Canada for several years.

The plant has a daily processing capacity of approximately 50 cubic meters of concrete per hour.

The operation of the plant requires an Environmental License as the activities of batching are in Class 1 Development.

The report highlights the process of the BMH DEC50 concrete products batch plant and its impact on immediate environment.

In terms of impact to the environment, the main concerns are related to soil pollution, groundwater pollution, surface water pollution, air pollution, noise pollution, human health, and habitat destruction.

Mitigation measures are inherent in the DEC 50 to avoid the spread of contaminants into the environment.

The Environment Act Proposal concludes that the plant operates within acceptable environment limits.

Therefore, for this remote plant, Innovative Civil Constructors applies for the Environment Act License to the Manitoba Conservation and Water Stewardship by submitting an Environment Act Proposal.



1. Introduction and Background

ICCI plant is a mobile ready mix concrete plant certified by Manitoba ready Mix Concrete Association.

The plant combines sand, aggregate (rocks and gravel), fly ash, cement, admixtures and/or water to form concrete. The pre-mix concrete produced is either wet or dry depending on the site requirements.

For the wet mix concrete, the product will be put into mixer trucks for delivery to various locations within 20 km of the plant location.

ICCI produces concrete product for our sole purposes and does not intend to produce product for retail to any other entity.

The facility utilizes the following equipment and accessories in the batching process:

- Drum dryer, using propane
- for drying aggregate
- Mixer, for blending the dry components of the concrete
- Cement weigh hopper
- Aggregate weigh hopper
- Cement silos
- Aggregate bins
- Conveyors
- Batch plant controls
- Dust collectors
- Air compressor



2. Description of the Plant Location under this application

2.1. Location

Plant will be located in an abandoned rock quarry that was used for base fill for the new East Side Road R11 contract. Currently under construction.

It is described legally as;

SE ¼ Sec 24 Twp 038 Rge 004 E1 (permit # CQP-2015-1007088)

SW ¼ Sec 19 Twp 038 RGE 005 E1 (permit # CQP-2015-1007087)

And is located East side of New All Seasons Road contract R9 at approximately 151 km

2.4. Batching Operation

ICCI will use the BMH DEC 50 mobile concrete batching plant. Equipment technical brochure attached (Attachments)

2.4.1. Wet-mix process

Prior to commencement of batching, a ready mix truck is positioned under the loading chute.

For each batch, the requisite batch ingredients (cementitious, water, aggregates and admixtures) are weighed or metered in a given sequence controlled by the batch plant computer. Cementitious is discharged by auger and gravity in a controlled manner from the silos; sand and coarse aggregates are discharged from the weigh-bins along a conveyor.

Water and admixtures are added to the truck load by volume metering.

Dust emitting from the truck area is controlled via fine tuning of the batching sequence to deliver a smooth, controlled flow of raw material into the mixer with a combination of water addition to control dust emissions.

Once all materials are in the truck's mixing drum, the revolution speed of the drum is increased to mixing speed for travel on roads to the project site.

2.4.2. Dry-mix process

(Process not used on this application)

While the plant can produce a dry mix for extended delivery it is not planned or required at this site as the location is within approximately 10km.

Aggregates and cementitious materials are mixed in the plant without addition of water.

Dry materials applications are typically used for shotcrete are mixed with water, any admixtures, and accelerator at customer site. Specific equipment is designed for transporting pneumatically dry materials to a nozzle where water, any liquid admixtures and accelerator are introduced into the stream feed and then immediately sprayed onto the target surface's underground.

3. Description of Existing Environment in the Plant Area

3.1. Biophysical environment

3.1.1. Terrain features

The facility is located beside the ESRA R11 road contract on the East side of the road at Stn 151 280.000 to Stn 151 360.000, where there are neither natural hills nor valleys. Due to excavation on a separate contract the site is approximately 10 meters below grade.

Berens River waterway are situated approximately 1km East and Pigeon River 10 km South to the proposed site at about 10 km.

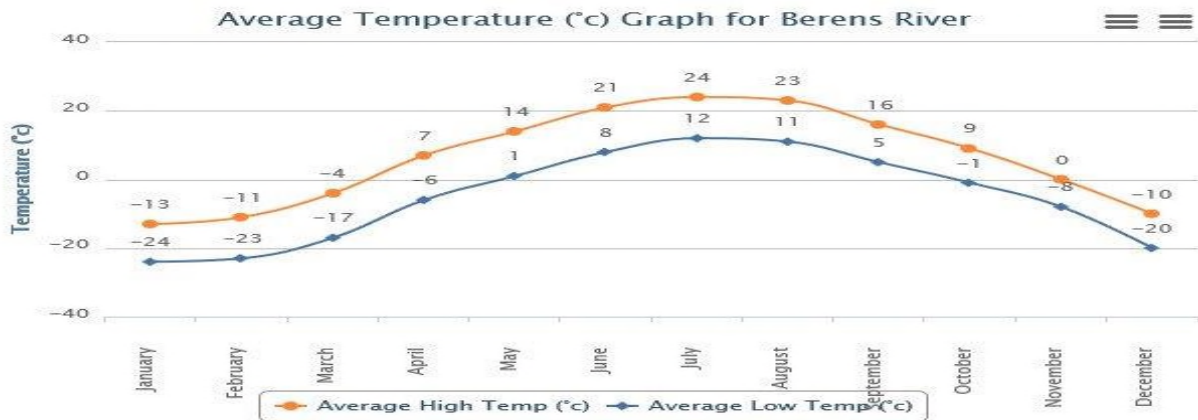
Other than the new road under construction there is no permanent or existing structures and there is no ready public access.



3.1.2. Climate

The prevailing climate and meteorological conditions of Berens River are marked by a subarctic climate, with long, bitterly cold winters, and short but warm summers. Monthly mean temperatures range from minus 23.9 °C in January to plus 24.2 °C in July, and the annual mean is 1.9 °C.

Though a majority of the annual precipitation of 509 millimeters falls from June to September, winter is by no means devoid of precipitation. Snow falls mainly from late October to May, totaling 187 centimeters per year. (Source: [the weather network.com](http://the.weather.network.com))



3.1.3. Aquatic environment

Regarding the aquatic environment, as the plant will be approximately 10m below grade in the abandoned quarry and there is no risk to the distant waterways

3.1.4. Terrestrial environment

The area is surrounded by thick trees and vegetation. However, in the surroundings of the facility, there is no presence of any rare, threatened or endangered species or any important or sensitive species and/or habitats. Again the chosen location acts as a natural shield to transmission of contaminants to the surrounding area.

3.2. Socioeconomic environment

3.2.1. Public safety risk

There is no public safety risk related to plant operations. The community of both Berens River and Pigeon River Bands are approximately 18 km away.

3.2.2. Protected areas

There are no national and provincial protected parks in immediate area.

3.2.3. Heritage resources

There are no identified assets in the vicinity of the proposed plant.



4. Description of Environment and Human Health Effects of the Plant

4.1. Batching materials

4.1.1. Aggregates

Aggregates typically consisting of a single sand (5mm down) and a single gravel or crushed stone (10 mm to 20 mm max) are delivered to the yard by dump trailer trucks.

The aggregates are stored in stockpile areas and storage bins at the plant. The amount on site at any one time will be in the magnitude of the requirements to manufacture 500 cubic meters of redi-mix concrete.

4.1.2. Cementitious materials

Portland cements types 2 and fly ash brought together to site combined and are stored in an elevated silo by bulk tanker trucks.

Each truck is equipped with an air blower system which enables it to blow the cement and fly ash mixture into the silo.

4.1.3. Admixtures

In order to impart particular properties to the concrete mixture, admixtures are used in the batching process. The mentioned admixtures are preloaded and housed in plastic tanks located in the auxiliary controls trailer provided by Sika Canada as bulk. Small plastic containers proved by SIKA are used for specialty mixes.

4.1.4. Water supply

Water for production will be drawn by self pumping tanker truck from the Pigeon River Waterway. The inlet tube will have a screen to prevent biological or fish or other animal life from being drawn from the environment special care in selecting the optimal location within the waterway to further minimize distress to the environment will be done in consultation with our Fish Biologist at AAE Tech.

Average anticipated daily use of water for this project will be 20,000 liters / day

The water is used for the following purposes:

- Mix water for batching concrete loads in the wet-process
- Filling truck-mounted water tank
- Dust suppression in the plant yard in high traffic areas
- Cleaning trucks and equipment in the marshalling area.

*** ICCI may explore well type groundwater at a later time within this construction period. At such time an amendment to this current permit application will be filled with this office.

4.2. Potential impacts of the plant on the environment

4.2.1. Impact on biophysical environment

Due to the selected location within the shallows of the abandoned quarry no impact of actual plant operations on wildlife, fisheries, surface water, groundwater, and forestry resources. Please see base maps and aerial photographs in attached documents.



4.2.2. Pollutants

Major emissions come from:

- aggregate Dryer: exhausts of combustion products of propane in the atmosphere
- dust particle emissions: the batching process generates dust

In addition, the operation can generate wastes in the form of excess concrete being brought back to the concrete batching plant within agitator trucks. In such case, all of this excess concrete is used to build precast concrete blocks used for construction barricades, formwork blocking and construction traffic control.

4.2.3. Hazardous wastes

Any hazardous waste will be collected and transported to Winnipeg Landfill site according to their guidelines.

4.2.4. Storage of gasoline and associated products

- No gasoline or diesel fuel will be stored on this site
- All trucks will be fueled offsite at the approved and licensed HMCL facility
- Fuel for the equipment generator will also be transported in a purpose made fuel cube that will have mechanical connections and form part of the generating system. The cube itself will be double walled steel.

4.2.5. Impact on heritage resources

There is none.

4.2.6. Socioeconomic implications

There are no socioeconomic implications resulting from environmental impact.

4.3. Potential impacts of the plant on Human health and safety

There is no potential impact on human health and safety resulting from any release of pollutants from the plant.

5. Mitigation measures and Residual Environment Effects

5.1. Mitigation of dust emissions

5.1.1. Dust collection systems

The plant is equipped with dust collection systems (in bagging area, aggregates bins area, silos area and drying process) which have bag-houses used to control dust emissions from cement, fly ash and aggregates. These emissions occur when materials are loaded into silos, bins and hoppers.

Dust collectors are inspected and cleaned on a monthly basis, and the fines are put back into the process.

The use of dust collection system mitigates any potential impacts of dust as air pollutant on the environment.

5.1.2. Smooth flow

Dust emitting from the truck area is controlled via fine tuning of the batching sequence to deliver a smooth and controlled flow of raw material into the mixer with a combination of water addition to control dust emissions.



5.1.3. Additional Measures

To further prevent dust from readily entering the surrounding environment a purpose made shroud *see picture* (Attachments) is utilized in conjunction with the batching operation to further minimize unwanted transmissions.

5.1.4. Use of water

As said above, the water is used to mitigate dust impacts in the high traffic areas of the plant yard.

5.2. Waste Water / Washout Water Handling

5.2.1. Concrete Washout Water

A concrete washout area will be created at the usage site and also at the batch plant this will typically be a metal bin sized appropriately to handle daily use. The sediment from the concrete residue is allowed to settle and then water mostly through evaporation is eliminated any further quantity is then poured through a filter cloth medium to further eliminate unwanted release. Concrete from this operation is then collected in purpose made bins and either broken down for use in clean fill or appropriate approved waste facility.

5.2.2 Equipment Clean-down Water

Equipment will be installed on a gravel rock pad within the proposed quarry location a non-penetrable medium is specified below the crushed gravel waste and precipitation will shed from this medium to a purpose made tank are where solids are allowed to settle and elements with buoyance can be skimmed from the top-water is then again pumped to filter through a cloth medium and will be used as a dust control on access or other construction areas in proximity. Sediments will be regularly collected from the bin and disposed of at an appropriate waste facility.

5.3. Recycling returned concrete

Where operational and quality control restraints allow, any excess returned concrete is used to build precast as mentioned above.

Surplus material that cannot be used in this manor will be recycled to areas where clean fill is permitted or transported to an appropriate approved waste facility.

5.4. Spillage response

In case of spillage, the plant responds according to the company spill response plan described in the spill containment procedure. Some Health, Safety and Environment (HSE) procedures related to handling diesel fuel and indoor storage/usage of flammable liquids are attached to this report as a reference (Appendix E). Environmental Protection Plan



5.5. Material Safety Data Sheet (MSDS)

Each raw materials supplier provides an up-to-date MSDS documentation for the raw materials that are delivered and used in mixed concrete.

The plant has also its own MSDS documentation for each type of mixed concrete produced and delivered.

MSDS sheets and some Technical Data sheets are attached (Appendix G) for the following chemicals:

Plastocrete 161 HE: Water-reducer / retarder meeting ASTM C494/C494M. The product is an aqueous solution of lignosulfonate, amine, and compound carbohydrates.

Sika AER: Air entraining agent meeting ASTM C949 C494M. The product is an aqueous solution of neutralized resin acids and rosin acids.

Portland cement, Silica fume, Viscocrete, SikaTard 930, and Target Set Accelerator.

6. Follow-up, Monitoring & Reporting

6.1. Environmental guidelines

To ensure all environmental concerns, and precautions have been addressed and met, the ICCI Mobile Plant Operation follows the *Recommended Guideline for Environmental Practices for Canadian Ready Mixed Concrete Industry, Canadian Ready-Mixed Concrete Association (CRMCA), Mississauga - Ontario, May 2004.*

6.2. Preventive Maintenance Plan

ICCI has a comprehensive preventive maintenance program of its equipment. The program is performed through weekly checks that allow flexibility to react quickly to defect opportunities. Please find the plant maintenance checklist within the appendix

7. Close Out

7.1

Unlike permanent installations and plant facilities this plant will have completed its work within 1 year at this location, it will be dismantled and transported to the head office yard where it will be completely inspected and readied for the next project.

Upon demobilization of the equipment the parcel will be returned to state as determined previously by ESRA – ICCI – HMCL

8. Conclusions

The EAP is completed in accordance with Manitoba Conservation's Advice for a Class 1 Development. The report has highlighted the process of the ICCI – BMH DEC 50 concrete products batch plant and its impact on immediate environment.

It has been demonstrated through this report that ICCI will operate with respect to its surrounding environment.

Therefore, specific equipment and processes are used since the facility exists to mitigate any environment issue from the plant operations.

To sum up, the report shows that the plant will operate within acceptable environment limits.



Appendix 1

MDB DEC 50 Concrete Batch Plant Facility



MOBILE BATCH PLANTS

Whether for temporary installation, special projects or permanent facilities, the mobile concrete batch plants by BMH Systems provide an economical and reliable solution. These mobile plants have the advantage of being deployed in just a matter of days. Dry batch and central mix plants are available in a variety of aggregate and cement storage configurations and batch sizes. Whenever space limitations, fast set-up or easy moving are concerned, a BMH mobile batch plant is the optimal solution.

CHARACTERISTICS :

- Low profile and high mobility batch plant
- Quick and easy set-up
- No foundation/erection required, blocking only
- Telescopic legs
- Heavy duty frame
- Factory wired, plumbed and tested



EG-10MX



EG-8



DEC-50

[Watch video](#)

- [EG-10/EG-10MX](#)
- [EG-8](#)
- [DEC-50](#)

Whether for a temporary installation, a special project or for a permanent facility, the EG-10 and EG-10MX mobile concrete batch plants by BMH Systems are designed for optimal performance and reliability.

Our exclusive mobile plants need no concrete foundation and are ready for use in a snap. This economical system makes no compromise on quality, versatility or performance. All components used in our mobile plants are designed from the start to perform with outstanding results. In the long run it means minimum maintenance, less downtime and better access for servicing.



[Download PDF Brochure](#)

SPECIFICATIONS EG-10

Production capacity up to 200 yd³ (150 m³) per hour

FEATURES

- Low profile and high mobility batch plant
- Easy and quick set up time

- No foundation/erection required, blocking only
- Telescopic legs
- Aggregate bin, 4 compartments, 110 tons (100 metric tons)
- Direct front end loader charging of aggregates
- Cement bin, single compartment, 60 tons (55 metric tons)
- Cement bin aeration system
- Electromatic high and low level sensors, capacitance type
- Dust collector for cement bin
- Screw conveyors, 12" diameter (300 mm)
- Air compressor, 15 hp (11 kW)
- Aggregate belt conveyor, 42" (1 100 mm) ribbed belt
- Aggregate and cement scales, 12 yd³ (9 m³)
- Water meter, 4" m (75 mm) with slow feed valve
- Power panel
- Heavy duty frame, tri-axle, radial tires
- Pneumatic suspension, ABS brakes, lights and standard fifth wheel/king pin towing assembly
- Macropoxy primer with Shertane urethane nickel gray paint; safety yellow for safety equipment
- Factory wired, plumbed and tested

BATCHING CONTROL

- Manual panel

ELECTRICAL POWER

- Power panel 460 or 575 volts
- Other voltage available upon request

TRAVEL DIMENSIONS

- 65'-3" long (19,9 m)
- 14' wide (4,3 m)
- 14'-5" high (4,4 m)

WEIGHT

- **78,500 lb (35 600 kg)**

OPTIONS

- Computerized batch control system
- Moisture probe
- Auxiliary cement silos
- Mobility system for auxiliary silos
- Dust collection system
- Safety guards

SPECIFICATIONS EG-10MX

Production capacity up to 250 yd³ (190 m³) per hour

FEATURES

- Low profile and high mobility batch plant
- Easy and quick set up time
- No foundation/erection required, blocking only
- Telescopic legs
- RollMaster® reversing variable speed drum mixer, 6 yd³, 8 yd³, or 12 yd³ (4.5 m³, 6 m³ or 9 m³) complete with steel structure, service platform, safety guards and access stairway
- Aggregate bin, 4 compartments, 110 tons (100 metric tons)
- Direct front end loader charging of aggregates
- Cement bin, single compartment, 60 tons (55 metric tons)
- Cement bin aeration system
- Electromatic high and low level sensors, capacitance type
- Dust collection system, cement bin
- Screw conveyors, 12" diameter (300 mm)
- Air compressor, 15 hp (11 kW)
- Aggregate belt conveyor, 42" (1 100 mm) ribbed belt
- Aggregate and cement scales, 12 yd³ (9 m³)
- Water system, 4" (100 mm) with slow feed valve
- Power panel
- Heavy duty frame, tri-axle, radial tires
- Pneumatic suspension, ABS brakes, lights and standard fifth wheel/king pin towing assembly
- Macropoxy primer with Shertane urethane nickel gray paint; safety yellow for safety equipment
- Factory wired, plumbed and tested

BATCHING CONTROL

- Manual panel

ELECTRICAL POWER

- Power panel 460 or 575 volts
- Other voltage available upon request

TRAVEL DIMENSIONS

- 65'-3" long (19,9 m)
- 14' wide (4,3 m)
- 14'-5" high (4,5 m)

WEIGHT

- 78,500 lb (35 600 kg) for mobile batch plant
- 78,000 lb (35 380.2 kg) for mobile mixer

OPTIONS

- Emergency motors
- Dust collection system for mixer
- Computerized batch control system
- Moisture probe
- Auxiliary cement silos
- Mobility system for auxiliary cement silos

The EG-8 model is based on years of field experience and is set to produce 130 yd³ per hour of dry mix material. Its size, quality of construction, quick set up and versatility provides you absolute mobility to any job site.

All BMH mobile plants need no concrete foundation and are ready for use in a snap. This economical system and proven design makes no compromise on quality, versatility or performance. All components used in our mobile plants are designed from the start to perform with outstanding results. In the long run, it means reliable equipment, true production output with controlled batch mixes for satisfied customers



[Download PDF Brochure](#)

SPECIFICATIONS EG-8

Nominal production capacity is 130 yd³ (100 m³) per hour

FEATURES

- Batch plant nominal production capacity is 130 yd³ (100 m³) per hour
- No foundation/erection required
- Telescopic legs
- Aggregate bin, 3 compartments, 70 Tons total (65 metric tons)

- Direct front end loader charging
- Cement bin, single compartment, 40 Tons (35 metric tons)
- Low and high level sensors for cement bin
- Dust collector (cement bin)
- 36" (900 mm) belt conveyor feeding system, 10" (250 mm) screw conveyors
- Aggregate and cement scale of 10 yd³ (7.5 m³)
- Water meter, 3" (75 mm)
- Heavy duty frame, tandem axle and radial tires with pneumatic suspension and ABS brakes
- Macropoxy primer with Shertane urethane nickel gray paint
- Factory wired, piped and tested
- 10 hp (7.5 kW) air compressor

BATCHING CONTROL

- Manual panel

ELECTRICAL POWER

- Power panel 460 or 575 volts
- Can be used with a 100 kVA generator

TRAVEL DIMENSIONS

- 56'-7" long (17.3 m)
- 12' wide (3.7 m)
- 14' high (4.3 m)

WEIGHT

- 57,000 lb (25,850 kg)

OPTIONS

- Computerized batch control system
- Mobile batch office / admixtures storage
- Moisture probe
- Auxiliary cement silo
- Mobility system for auxiliary silo
- Dust collection system (loading area)
- Safety Guards

Whether for a temporary installation, a special project or for a permanent facility, the mobile concrete batch plants by BMH Systems are designed for optimal performance. Our exclusive mobile plants need no concrete foundation and are ready for use in a snap.

Any load size can be processed from the scale-mounted aggregate hoppers and cement bin. This economical system makes no compromise on quality, versatility or performance.

All components used in our mobile plants are designed from the start to perform with outstanding results.



[Download PDF Brochure](#)

SPECIFICATIONS DEC-50

Production capacity 65 yd³ (50 m³) per hour

FEATURES

- Low profile high mobility
- Decumulative batching
- Quick set up time
- No foundation/erection required, blocking only
- Telescopic legs
- Aggregate bin, 44 tons (40 metric tons), 2 compartments
- Direct front end loader charging of aggregates
- Cement bin, 33 tons (30 metric tons)
- Cement delivery: 2 screw conveyors, 10" (250 mm) diameter, 24'-0" (7,3 m) long, with 10 hp (7,5 kW) motors
- Transfer belt, 30" ribbed (760 mm)
- Electronic water meter, 2" (50 mm)
- Air compressor, 5 hp (3,7 kW)
- Air brakes, single axle, double wheels and fifth wheel
- Signal, brake and tail lights
- Factory wired and plumbed
- Factory tested

AGGREGATE BIN

- 20'-0" long (6,1 m)
- 8'-0" wide (2,4 m)
- 10'-3" high (3,1 m)

WEIGHING SYSTEM

- 2 digital weigh indicators
- Cement bin mounted on 4 load cells of 25 000 lb each (11 400 kg)
- Aggregate bin mounted on 4 load cells of 25 000 lb each (11 400 kg)

WEIGHT

- 32 000 lb (14 500 kg)

BATCHING CONTROL

- Manual electric/air

ELECTRICAL POWER

- Power panel, 460 or 575 Volts
- Other voltage available upon request

TRAVEL DIMENSIONS

- 55'-4" long (16,9 m)
- 8'-6" wide (2,6 m)
- 14'-2" high (4,4 m)

OPTIONS

- Cement bin extension, 11 tons (10 metric tons)
- 3 aggregates compartments with a total capacity of 44 tons (40 metric tons)
- Tandem axle, double wheel assembly
- Decumulative mobile cement bin, 33 tons (30 metric tons)
- Computerized batch control system
- Dust collector for cement bin
- Moisture probe
- Diesel generator power
- Cement bulk bag handling system

Appendix 2

Aerial Plan View of Proposed Facility Location



Environmental Act Application
SW Sec 19 Twp 38 Rge 5E



Barrens
River

152+000



151+000



150+000



All-Season Road
Centerline with
100m Right-Of-Way



Area of
Immediate
Quarrying



Current aerial view of
proposed location

SW Sec 19 Twp 38
Rge 5E



Berens River

Proposed Batch
Plant Area

Start of R9
Contract

Appendix 3

MSDS



 **EIFFAGE**

 **UNION CIVIL
CONSTRUCTORS INC.**

Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Fly Ash and Bottom Ash (Ash)

Product Identifiers: Coal Fly Ash, Class F Fly Ash, Class C Fly Ash, Type CI Fly Ash, Type CH Fly Ash, Type F Fly Ash, Lignite Coal Fly Ash, Subbituminous Coal Fly Ash, Anthracite Coal Fly Ash, Bituminous Coal Fly Ash, Bottom Ash, Ash

Manufacturer: Lafarge North America Inc.
12018 Sunrise Valley Drive, Suite 500
Reston, VA 20191

Information Telephone Number: 703-480-3600 (9am to 5pm EST)

Emergency Telephone Number: 1-800-451-8346 (3E Hotline)

Product Use: Fly Ash and Bottom Ash are used as a supplementary cementitious or pozzolanic material for cement, concrete and concrete products. It is also used in soil stabilization and as filler in asphalt and other products that are widely used in construction.

Note: This MSDS covers many types of ash. Individual composition of hazardous constituents will vary between types of ash.






Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL -TWA (mg/m ³)	ACGIH TLV-TWA (mg/m ³)	LD ₅₀ (mouse, intraperitoneal)	LC ₅₀
Fly Ash	<100	68131-74-8	NA	NA	NA	NA
Crystalline Silica	0-10	14808-60-7	[(10) / (%SiO ₂ +2)] (R); [(30) / (%SiO ₂ +2)] (T)	0.025 (R)	NA	NA
Particulate Not Otherwise Regulated	-	NA	5 (R) 15 (T)	3 (R) 10 (T)	NA	NA

Note: Fly ash and bottom ash are byproducts from the combustion of coal. Trace amounts of chemicals may be detected during chemical analysis. For example the chemicals identified can include carbon and complex silicates or oxides of aluminum (Al), calcium (Ca), magnesium (Mg), sodium (Na), sulfur (S), potassium (K), titanium (Ti), iron (Fe) and phosphorus (P). Chemical identity: M_xO_y•SiO₂ (M = Al, Ca, Mg and other minor metal, with bound silica (SiO₂)).

Chemical analysis of fly ash and bottom ash also indicate the presence of trace amounts of metals, such as: Arsenic (As), Barium (Ba), Beryllium (Be), Cobalt (Co), Lead (Pb), and Manganese (Mn).

Section 3: HAZARD IDENTIFICATION

	WARNING	 Respiratory Protection  Eye Protection  Gloves  Boots
	Irritant: Causes eye, skin and inhalation irritation Toxic - Harmful by inhalation. (Contains crystalline silica)	
Use proper engineering controls, work practices, and personal protective equipment to prevent exposure to wet or dry product.		
Read MSDS for details.		

Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Ash is a solid, grey/black or brown/tan, odorless powder which may contain solidified masses. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet ash can cause moderate eye irritation. Eye exposures require immediate first aid to prevent significant damage to the eye.

Skin Contact: Ash may cause dry skin, discomfort, and irritation.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure.

Ash may contain trace amounts of ammonia or ammonia bisulfate. Contact with water or moisture can cause the ammonia to be released from ash into the air. Inhalation of ammonia can cause coughing and irritation or burns to the nose, throat and lungs. These effects depend on the concentration of ammonia inhaled.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Ash is not listed as a carcinogen by IARC or NTP; however, ash contains trace amounts of crystalline silica which is classified by IARC and NTP as known human carcinogen.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Ingestion: Do not ingest ash. Although ingestion of small quantities of ash is not known to be harmful, large quantities can cause distress to the digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, irritation, and prolonged unprotected exposures to wet ash, cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Section 4: FIRST AID MEASURES (continued)

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis – which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis – occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis – results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method:	Non-combustible	Firefighting Equipment:	Ash poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.
General Hazard:	Avoid breathing dust.		
Extinguishing Media:	Use extinguishing media appropriate for surrounding fire.	Combustion Products:	None.

Section 6: ACCIDENTAL RELEASE MEASURES

General: Place spilled material into a container. Avoid actions that cause the ash to become airborne. Avoid inhalation of ash and contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet ash and place in container. Allow material to dry or solidify before disposal. Do not wash ash down sewage and drainage systems or into bodies of water (e.g. streams).

Waste Disposal Method: Dispose of ash according to Federal, State, Provincial and Local regulations.

Section 7: HANDLING AND STORAGE

General: Keep bulk and bagged ash and dry until used. Stack bagged material in a secure manner to prevent falling. Bagged ash is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures.

Engulfment hazard. To prevent burial or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains ash. Ash can buildup or adhere to the walls of a confined space. The ash can release, collapse or fall unexpectedly.

Section 7: HANDLING AND STORAGE (continued)

Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving ash through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and injury to workers.

Usage: Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.

Housekeeping: Avoid actions that cause the ash to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below.

Storage Temperature: Unlimited. **Storage Pressure:** Unlimited.

Clothing: Promptly remove and launder clothing that is dusty or wet with ash. Thoroughly wash skin after exposure to dust or wet ash.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls: Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits.

Personal Protective Equipment (PPE):

Respiratory Protection: Under ordinary conditions no respiratory protection is required. Wear a NIOSH approved respirator that is properly fitted and is in good condition when exposed to dust above exposure limits.

Eye Protection: Wear ANSI approved glasses or safety goggles when handling dust or wet ash to prevent contact with eyes. Wearing contact lenses when using ash, under dusty conditions, is not recommended.

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet ash or cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	Evaporation Rate:	NA.
Appearance:	Gray/black or brown/tan powder which may contain solidified masses.	pH (in water):	4-12
Odor:	None.	Boiling Point:	>1000° C
Vapor Pressure:	NA.	Freezing Point:	None, solid.
Vapor Density:	NA.	Viscosity:	None, solid.
Specific Gravity:	2 - 2.9	Solubility in Water:	Slightly (< 5%)

Section 10: STABILITY AND REACTIVITY

- Stability:** Stable. Keep dry until use. Avoid contact with incompatible materials.
- Incompatibility:** Ash is incompatible with acids, ammonium salts and aluminum metal. Ash dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Ash reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.
- Hazardous Polymerization:** None. **Hazardous Decomposition:** None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION

- OSHA/MSHA Hazard Communication:** This product is considered by OSHA/MSHA to be a hazardous chemical and should be included in the employer's hazard communication program.
- CERCLA/SUPERFUND:** This product is not listed as a CERCLA hazardous substance.
- EPCRA SARA Title III:** This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.
- EPCRA SARA Section 313:** This product contains none of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
- RCRA:** If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.
- TSCA:** Ash and crystalline silica are exempt from reporting under the inventory update rule.
- California Proposition 65:** Crystalline silica (airborne particulates of respirable size) is known by the State of California to cause cancer.
- WHMIS/DSL:** Products containing crystalline silica are classified as D2A and are subject to WHMIS requirements.



Section 16: OTHER INFORMATION
Abbreviations:

>	Greater than	NA	Not Applicable
ACGIH	American Conference of Governmental Industrial Hygienists	NFPA	National Fire Protection Association
CAS No	Chemical Abstract Service number	NIOSH	National Institute for Occupational Safety and Health
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NTP	National Toxicology Program
		OSHA	Occupational Safety and Health Administration
CFR	Code for Federal Regulations	PEL	Permissible Exposure Limit
CL	Ceiling Limit	pH	Negative log of hydrogen ion
DOT	U.S. Department of Transportation	PPE	Personal Protective Equipment
EST	Eastern Standard Time	R	Respirable Particulate
HEPA	High-Efficiency Particulate Air	RCRA	Resource Conservation and Recovery Act
HMIS	Hazardous Materials Identification System	SARA	Superfund Amendments and Reauthorization Act
		T	Total Particulate
IARC	International Agency for Research on Cancer	TDG	Transportation of Dangerous Goods
LC ₅₀	Lethal Concentration	TLV	Threshold Limit Value
LD ₅₀	Lethal Dose	TWA	Time Weighted Average (8 hour)
mg/m ³	Milligrams per cubic meter	WHMIS	Workplace Hazardous Materials Information System
MSHA	Mine Safety and Health Administration		

This MSDS (Sections 1-16) was revised on March 1, 2008.

An electronic version of this MSDS is available at: www.lafarge-na.com under the Products section.

Lafarge North America Inc. (LNA) believes the information contained herein is accurate; however, LNA makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein which is not intended to be and should not be construed as legal advice or as insuring compliance with any federal, state or local laws or regulations. Any party using this product should review all such laws, rules, or regulations prior to use, including but not limited to US and Canada Federal, Provincial and State regulations.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE.

Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Portland Cement (cement)

Product Identifiers: Cement, Portland Cement, Hydraulic Cement, Oil Well Cement, Trinity® White Cement, Antique White Cement, Portland Limestone Cement, Portland Cement Type I, IA, IE, II, I/II, IIA, II L.A., III, IIIA, IV, IVA, V, VA, 10, 20, 30, 40, 50, GU, GUL, MS, MH, HE, LH, HS, OWH, OWG Cement, OW Class G HSR

Manufacturer: Lafarge North America Inc.
12018 Sunrise Valley Dr, Suite 500
Reston, VA 20191

Information Telephone Number: 703-480-3600 (9am to 5pm EST)

Emergency Telephone Number: 1-800-451-8346 (3E Hotline)

Product Use: Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

Note: This MSDS covers many types of Portland cement. Individual composition of hazardous constituents will vary between types of Portland cement.

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL -TWA (mg/m ³)	ACGIH TLV-TWA (mg/m ³)	LD ₅₀ (mouse, intraperitoneal)	LC ₅₀
Portland Cement*	100	65997-15-1	15 (T); 5 (R)	1 (R)	NA	NA
Calcium Sulfate*	2-10	13397-24-5	15 (T); 5 (R)	10 (T)	NA	NA
Calcium Carbonate*	0-15	1317-65-3	15 (T); 5 (R)	3 (R), 10 (T)	NA	NA
Calcium Oxide	0-5	1305-78-8	5 (T)	2 (T)	3059 mg/kg	NA
Magnesium Oxide	0-4	1309-48-4	15 (T)	10 (T)	NA	NA
Crystalline Silica	0-0.2	14808-60-7	[(10) / (%SiO ₂ +2)] (R); [(30) / (%SiO ₂ +2)] (T)	0.025 (R)	NA	NA

Note: Exposure limits for components noted with an * contain no asbestos and <1% crystalline silica

Cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis. For example, cement may contain trace amounts of calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, nickel compounds, and other trace compounds.

Section 3: HAZARD IDENTIFICATION

	WARNING	
<p>Corrosive - Causes severe burns. Toxic - Harmful by inhalation. (Contains crystalline silica)</p> <p>Use proper engineering controls, work practices, and personal protective equipment to prevent exposure to wet or dry product.</p> <p>Read MSDS for details.</p>		

Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Cement is a solid, grey, off white, or white odorless powder. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard. Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible tissue (skin, eye, respiratory tract) damage due to chemical (caustic) burns, including third degree burns.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet cement can cause moderate eye irritation, chemical burns and blindness. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact: Cement may cause dry skin, discomfort, irritation, severe burns, and dermatitis.

Burns: Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible damage to skin, eye, respiratory and digestive tracts due to chemical (caustic) burns, including third degree burns. A skin exposure may be hazardous even if there is no pain or discomfort.

Dermatitis: Cement is capable of causing dermatitis by irritation and allergy. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling, and cracking.

Irritant dermatitis is caused by the physical properties of cement including alkalinity and abrasion.

Allergic contact dermatitis is caused by sensitization to hexavalent chromium (chromate) present in cement. The reaction can range from a mild rash to severe skin ulcers. Persons already sensitized may react to the first contact with cement. Others may develop allergic dermatitis after years of repeated contact with cement.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Cement is not listed as a carcinogen by IARC or NTP; however, cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Section 3: HAZARD IDENTIFICATION (continued)

Ingestion: Do not ingest cement. Although ingestion of small quantities of cement is not known to be harmful, large quantities can cause chemical burns in the mouth, throat, stomach, and digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) or sensitivity to hexavalent chromium can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis – which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis – occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis – results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method:	Non-combustible	Firefighting Equipment:	Cement poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.
General Hazard:	Avoid breathing dust. Wet cement is caustic.	Combustion Products:	None.
Extinguishing Media:	Use extinguishing media appropriate for surrounding fire.		

Section 6: ACCIDENTAL RELEASE MEASURES

- General:** Place spilled material into a container. Avoid actions that cause the cement to become airborne. Avoid inhalation of cement and contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet cement and place in container. Allow material to dry or solidify before disposal. Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).
- Waste Disposal Method:** Dispose of cement according to Federal, State, Provincial and Local regulations.

Section 7: HANDLING AND STORAGE

- General:**
 - Keep bulk and bagged cement dry until used. Stack bagged material in a secure manner to prevent falling. Bagged cement is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures.
 - Engulfment hazard. To prevent burial or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains cement. Cement can buildup or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.
 - Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving cement powders through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and injury to workers.
- Usage:** Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.
- Housekeeping:** Avoid actions that cause the cement to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below.
- Storage Temperature:** Unlimited.
- Storage Pressure:** Unlimited.
- Clothing:** Promptly remove and launder clothing that is dusty or wet with cement. Thoroughly wash skin after exposure to dust or wet cement.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

- Engineering Controls:** Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits.
- Personal Protective Equipment (PPE):**
 - Respiratory Protection:** Under ordinary conditions no respiratory protection is required. Wear a NIOSH approved respirator that is properly fitted and is in good condition when exposed to dust above exposure limits.
 - Eye Protection:** Wear ANSI approved glasses or safety goggles when handling dust or wet cement to prevent contact with eyes. Wearing contact lenses when using cement, under dusty conditions, is not recommended.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION (continued)

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	Evaporation Rate:	NA.
Appearance:	Gray, off white or white powder.	pH (in water):	12 – 13
Odor:	None.	Boiling Point:	>1000° C
Vapor Pressure:	NA.	Freezing Point:	None, solid.
Vapor Density:	NA.	Viscosity:	None, solid.
Specific Gravity:	3.15	Solubility in Water:	Slightly (0.1 - 1.0%)

Section 10: STABILITY AND REACTIVITY

Stability: Stable. Keep dry until use. Avoid contact with incompatible materials.

Incompatibility: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

Hazardous Polymerization: None. **Hazardous Decomposition:** None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION


OSHA/MSHA Hazard Communication: This product is considered by OSHA/MSHA to be a hazardous chemical and should be included in the employer's hazard communication program.

CERCLA/SUPERFUND: This product is not listed as a CERCLA hazardous substance.

EPCRA SARA Title III: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.

EPRCA SARA Section 313: This product contains none of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Section 15: REGULATORY INFORMATION (continued)

RCRA:	If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.
TSCA:	Portland cement and crystalline silica are exempt from reporting under the inventory update rule.
California Proposition 65:	Crystalline silica (airborne particulates of respirable size) and Chromium (hexavalent compounds) are substances known by the State of California to cause cancer.
WHMIS/DSL: 	Products containing crystalline silica and calcium carbonate are classified as D2A, E and are subject to WHMIS requirements.

Section 16: OTHER INFORMATION
Abbreviations:

>	Greater than	NA	Not Applicable
ACGIH	American Conference of Governmental Industrial Hygienists	NFPA	National Fire Protection Association
CAS No	Chemical Abstract Service number	NIOSH	National Institute for Occupational Safety and Health
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NTP	National Toxicology Program
		OSHA	Occupational Safety and Health Administration
CFR	Code for Federal Regulations	PEL	Permissible Exposure Limit
CL	Ceiling Limit	pH	Negative log of hydrogen ion
DOT	U.S. Department of Transportation	PPE	Personal Protective Equipment
EST	Eastern Standard Time	R	Respirable Particulate
HEPA	High-Efficiency Particulate Air	RCRA	Resource Conservation and Recovery Act
HMIS	Hazardous Materials Identification System	SARA	Superfund Amendments and Reauthorization Act
		T	Total Particulate
IARC	International Agency for Research on Cancer	TDG	Transportation of Dangerous Goods
LC ₅₀	Lethal Concentration	TLV	Threshold Limit Value
LD ₅₀	Lethal Dose	TWA	Time Weighted Average (8 hour)
mg/m ³	Milligrams per cubic meter	WHMIS	Workplace Hazardous Materials Information System
MSHA	Mine Safety and Health Administration		

This MSDS (Sections 1-16) was revised on March 1, 2011.

An electronic version of this MSDS is available at: www.lafarge-na.com under the Sustainability section.

Lafarge North America Inc. (LNA) believes the information contained herein is accurate; however, LNA makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein which is not intended to be and should not be construed as legal advice or as insuring compliance with any federal, state or local laws or regulations. Any party using this product should review all such laws, rules, or regulations prior to use, including but not limited to US and Canada Federal, Provincial and State regulations.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE.



SECTION I: PRODUCT INFORMATION

PRODUCT: **Sika® Air 260**REVISION DATE: January 15th, 2015

USAGE: Air Entrainer for Concrete

MANUFACTURER/SUPPLIER: SIKA CANADA INC.
601, avenue Delmar
Pointe Claire, QC
H9R 4A9**EMERGENCY TELEPHONE NUMBER: CANUTEC (collect) (613) 996-6666**

TDG CLASSIFICATION: Not Regulated

WHMIS Classification: D2B

UN NUMBER: Not Established

Class: Not Established

Packaging Group: Not Established

SECTION II: HAZARDOUS INGREDIENTS

Hazardous ingredients	%	T.L.V.	# CAS	LD ₅₀ (mg/kg) (Species, route)	LC ₅₀ (Species, route)
DIETHYLENE GLYCOL	1-5	Not Available	111-46-6	19 600 (oral, rat)	Not Available

SECTION III: PHYSICAL CHARACTERISTICS

Physical State: Liquid
Appearance and Odor: Brown liquid with no odor

Odor Threshold: Not Available
Evaporation Rate: Same as water
Vapor Density: Not Available
Vapor Pressure: Not AvailableBoiling Point: 104.4°C
Freezing Point: Not Available
Density: 1.012 ± 0.015g/ml @ 25°C
Water Solubility: Yes (100%)
pH: 10.5 – 12.5
% volatility: Not Available
Water/Oil Distribution: Not Available



PRODUCT: Sika® Air 260

SECTION IV: FIRE AND EXPLOSION HAZARDS

Flammability:	No	TDG Flammability Class:	Not Applicable
If Yes, under what conditions:		Flammable upper limits (% vol.):	Not Applicable
Extinguishing methods:	Foam, dry chemical product, CO ₂ , water hose.	Flammable lower limits (% vol.):	Not Applicable
Special Methods:	Firefighters must wear their usual protection equipment and respiratory equipment. The water hose could be used to cool down the containers and to dissipate the vapors over the spill.	Flash Point (method used):	Not Available
		Auto-ignition temperature:	Not Applicable
		Dangerous Combustion Products:	Oxides of Carbon, nitrogen and sulfur.
		Protect from mechanical impact:	No
		Protect from static discharge:	No

SECTION V: REACTIVITY

Chemical stability:	Yes	Dangerous decomposition products:	Oxides of Carbon, nitrogen and sulfur.
If not, under what conditions:			
Incompatibility with other material:	Yes		
If Yes, which ones:	Oxidizing agents.	Polymerization Risks:	Will not occur



PRODUCT: Sika® Air 260

SECTION VI: TOXIC PROPERTIES

ROUTE OF ENTRY / CONTACT

Eyes: Contact may cause irritation with redness, pain and tearing.

Skin: May cause skin irritation with redness, swelling, itching and burning on prolonged contact.

Inhalation: Vapors or mists may cause nose, throat and upper respiratory irritation, and central nervous system effects such as headache, dizziness, nausea, euphoria and drowsiness.

Ingestion: May cause irritation of the mouth, throat and gastrointestinal tract, nausea, vomiting and diarrhea.

Carcinogenicity: Not Established

Toxic effects on reproduction: Not Established

Teratogenicity: Not Established

Mutagenicity: Not Established

Product with synergistic effects: Not Established

An acute or chronic exposure will increase the toxic effects mentioned in this section.



PRODUCT: Sika® Air 260

SECTION VII: PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

Gloves: Natural rubber, neoprene or polyethylene gloves.

Respirator: NIOSH approved mask can be worn if exposure levels are exceeded.

Eyes: Safety glasses. Under misty conditions, do not wear contact lenses.

Shoes: Ordinary.

Clothing: Rubber Apron.

Other: Eye wash fountain.

OTHERS

Ventilation: Sufficient ventilation required.

Procedure in case of leaks: Absorb with sand or other absorbent material. Residue may be removed with steam or hot water and soap.

Handling and Equipment methods: Avoid skin, eye and clothing contact. Maintain good personal hygiene.

Warehouse Requirements: Keep all containers closed in a cool, dry area. Protect from freezing.

Special Shipping Instructions: See TDG class

Waste Disposal: Dispose of sand and rinse water according to municipal, provincial or federal laws for disposal of chemicals.



PRODUCT: Sika® Air 260

SECTION VIII: FIRST AID

Skin: Remove and clean all contaminated clothing.
Wash with plenty of soap and water, for at least 10 minutes.
Use moisture creams on affected areas.
Consult a physician if required.

Eyes: Rinse immediately with luke warm water, while holding eyelids open, for at least 20 minutes.
Consult a physician if an irritation persists.

Inhalation: In the case of overexposure, evacuate to fresh air.
Consult a physician if required.

Ingestion: Drink plenty of water. Do not induce vomiting.
Do not give anything by mouth to an unconscious person.
See a physician immediately.

SECTION IX: PREPARATION INFORMATION

Prepared By: Sika Canada R & D.
Telephone #: (514) 697-2610
Fax #: (514) 694-2792

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SECTION I: PRODUCT INFORMATION

PRODUCT: **Plastocrete 161^{CA}**

REVISION DATE: July 3, 2009

USAGE:

MANUFACTURER: SIKA CANADA INC.
18131 – 114th Avenue N.W.
Edmonton, AB
T5S 1T8

EMERGENCY TELEPHONE NUMBER: CANUTEC (collect) (613) 996-6666

TDG CLASSIFICATION:	Not Regulated	WHMIS Classification:	D2B
UN NUMBER:	Not Established	Class:	Not Established
Packaging Group:	Not Established		

SECTION II: HAZARDOUS INGREDIENTS

Hazardous ingredients	%	T.L.V.	# CAS	LD ₅₀ (mg/kg) (Species, route)	LC ₅₀ (Species, route)
TRI-ETHANOLAMINE	3-7	Not Available	102-7-6	8000 (oral, rat)	Not Available

SECTION III: PHYSICAL CHARACTERISTICS

Physical State:	Liquid	Boiling Point:	> 100°C
Appearance and Odor:	Dark brown with sweet odor	Freezing Point:	< 0°C
Odor Threshold:	Not Applicable	Density:	1.181 – 1.187 g/ml @ 23°C
Evaporation Rate:	< 1 (Butyl Acetate = 1)	Water Solubility:	Infinite
Vapor Density:	Not Applicable	pH:	7 - 9
Vapor Pressure:	21.068 mm Hg @ 23°C	% volatility:	Not Applicable
		Water/Oil Distribution:	Not Applicable



PRODUCT: **Plastocrete 161^{CA}**

SECTION IV: FIRE AND EXPLOSION HAZARDS

Flammability:	No	TDG Flammability Class:	Not Applicable
If Yes, under what conditions:		Flammable upper limits (% vol.):	Not Applicable
Extinguishing methods:	CO ₂ , Foam and ABC powder	Flammable lower limits (% vol.):	Not Applicable
		Flash Point (method used):	Not Applicable
Special Methods:	None	Auto-ignition temperature:	Not Applicable
		Dangerous Combustion Products:	Carbon oxides
		Protect from mechanical impact:	No
		Protect from static discharge:	No

SECTION V: REACTIVITY

Chemical stability:	Yes	Dangerous decomposition products:	Carbon oxides
If not, under what conditions:			
Incompatibility with other material:	Yes	Polymerization Risks:	Not Established
If Yes, which ones:	Strong acids, strong oxidizing agents, high inorganic salt concentrations.		



PRODUCT: **Plastocrete 161^{CA}**

SECTION VI: TOXIC PROPERTIES

ROUTE OF ENTRY / CONTACT

Eyes: Mildly irritating. (contact)

Skin: Mildly irritating and may cause drying of the skin. (contact)

Inhalation: Mist may cause minor headache, slight dizziness and nausea.

Ingestion: Mild irritation of mouth and throat. May cause diarrhea.

Carcinogenicity: Not Applicable

Toxic effects on reproduction: Not Applicable

Teratogenicity: Not Established

Mutagenicity: Not Established

Product with synergistic effects: Not Applicable

An acute or chronic exposure will increase the toxic effects mentioned in this section.



PRODUCT: **Plastocrete 161^{CA}**

SECTION VII: PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

Gloves: Natural rubber, neoprene or polyethylene gloves.

Respirator: NIOSH approved mask, generally not needed with adequate ventilation. Necessary in areas of poor ventilation.

Eyes: Safety glasses. Under misty conditions, do not wear contact lenses.

Shoes: Ordinary.

Clothing: Rubber Apron.

Other: Eye wash fountain.

OTHERS

Ventilation: Sufficient ventilation required.

Procedure in case of leaks: Absorb with sand or other absorbent material. Residue may be removed with steam or hot water and soap.

Handling and Equipment methods: Avoid skin, eye and clothing contact. Maintain good personal hygiene.

Warehouse Requirements: Keep all containers closed in a cool, dry area. Protect from freezing.

Special Shipping Instructions: See TDG class

Waste Disposal: Dispose of sand and rinse water according to municipal, provincial or federal laws for disposal of chemicals.



PRODUCT: Plastocrete 161^{CA}

SECTION VIII: FIRST AID

Skin: Remove and clean all contaminated clothing. Wash with plenty of soap and water, for at least 10 minutes. Use moisture creams on affected areas. Consult a physician if required.

Eyes: Rinse immediately with luke warm water, while holding eyelids open, for at least 20 minutes. Consult a physician if an irritation persists.

Inhalation: In the case of overexposure, evacuate to fresh air. Consult a physician if required.

Ingestion: Drink plenty of water. Do not induce vomiting. Do not give anything by mouth to an unconscious person. See a physician immediately.

SECTION IX: PREPARATION INFORMATION

Prepared By: Steve Gosselin
Telephone #: (514) 697-2610
Fax #: (514) 694-2792

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**SECTION I: PRODUCT INFORMATION**PRODUCT: **Sika® ViscoCrete® 2100**

REVISION DATE: February 15, 2009

USAGE: WATER REDUCER ADMIXTURE

MANUFACTURER: SIKA CANADA INC.
601, avenue Delmar
Pointe Claire, QC
H9R 4A9**EMERGENCY TELEPHONE NUMBER: CANUTEC (collect) (613) 996-6666**TDG CLASSIFICATION: Not Regulated
UN NUMBER: Not Established
Packaging Group: Not ApplicableWHMIS Classification: D2B
Class: Not Applicable**SECTION II: HAZARDOUS INGREDIENTS**

Hazardous ingredients	%	T.L.V.	# CAS	LD ₅₀ (mg/kg) (species, route)	LC ₅₀ (species, route)
None					

SECTION III: PHYSICAL CHARACTERISTICSPhysical State: Liquid
Appearance and Odor: Light blue liquid, characteristic
odor
Odor Threshold: Not Established
Evaporation Rate: < 1 (water)
Vapor Density: < 1 (water)
Vapor Pressure: 17 mm (20°C)Boiling Point: > 100°C
Freezing Point: < 0°C
Density: 1.08 g/ml
Water Solubility: Yes
pH: Not Established
% volatility: < 60
Water/Oil Distribution: Not Established



PRODUCT: Sika® ViscoCrete® 2100

SECTION IV: FIRE AND EXPLOSION HAZARDS

Flammability: If Yes, under what conditions:	No	TDG flammability Class:	Not Regulated
Extinguishing methods:	Foam, dry chemical product, CO ₂ , water hose.	Flammable upper limits (% vol.):	Not Applicable
Special Methods:	Firefighters must wear their usual protection equipment and respiratory equipment. The water hose could be used to cool down the containers and to dissipate the vapors over the spill.	Flammable lower limits (% vol.):	Not Applicable
		Flash Point (method used):	Not Applicable
		Auto-ignition temperature:	Not Established
		Dangerous Combustion Products:	Carbon Oxides.
		Protect from mechanical impact:	No
		Protect from static discharge:	No

SECTION V: REACTIVITY DATA

Chemical stability: If not, under what conditions:	Yes Excessive heat can degrade the resin.	Dangerous decomposition products:	Carbon Oxides.
Incompatibility with other material: If Yes, which ones:	No	Polymerization Risks:	No



PRODUCT: Sika® ViscoCrete® 2100

SECTION VI: TOXIC PROPERTIES

ROUTE OF ENTRY / CONTACT

Eyes: May cause eye irritation.

Skin: May cause skin irritation.

Inhalation: May cause irritation to the lungs.

Ingestion: May cause irritation to the G.I. System.

Carcinogenicity: No

Toxic effects on reproduction: No

Teratogenicity: No

Mutagenicity: No

Product with synergistic effects: Not Established

An acute or chronic exposure will increase the toxic effects mentioned in this section and may aggravate respiratory problems.



PRODUCT: Sika® ViscoCrete® 2100

SECTION VII: PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

Gloves: Chemical products resistant gloves.

Respiratory equipment: Not necessary.

Eyes: Safety glasses

Shoes: Ordinary

Clothing: Rubber Apron

Other: No

OTHERS

Ventilation: Sufficient ventilation required.

Procedure in case of leaks: Absorb with sand and other absorbent material.

Handling and Equipment methods: Avoid skin, eye and clothing contact.

Warehouse Requirements: Keep all containers closed in a cool, dry area. Protect from freezing.

Special Shipping Instructions: Protect from freezing.

Waste Disposal: Dispose of sand and water according to municipal, provincial and federal laws on chemical waste.



PRODUCT: Sika® ViscoCrete® 2100

SECTION VIII: FIRST AID

Skin: Remove and clean all contaminated clothing.
Wash with plenty of soap and water the exposed areas.
Consult a physician if necessary.

Eyes: Clean with water for at least 15 minutes.
Consult a physician if necessary.

Inhalation: In the case of overexposure, evacuate to fresh air.
Consult a physician if needed.

Ingestion: Do not induce vomiting. Drink plenty of water.
Do not give anything by mouth to an unconscious person.
Consult a physician.

SECTION IX: PREPARATION INFORMATION

Prepared By : Steve Gosselin
Telephone # : (514) 697-2610
Fax # : (514) 694-2792

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Product Data Sheet

Edition 08.2012/v1
 CSC Master Format™ 03 05 00
 Sika® Air 260

Sika® Air 260 (Formerly Catexol A.E. 260)

Air-Entraining Admixture for Concrete

Description Sika® Air 260 is an aqueous solution of a unique, synthetically manufactured surfactant for the air entrainment of concrete. Sika® Air 260's exclusive formula provides superior controllability of the air content and finishability in air-entrained concrete.

Sika® Air 260 increases concrete's durability, making it more resistant to the damaging effects of freezing and thawing, while improving workability and reducing bleeding. Sika® Air 260 is carefully formulated and subjected to stringent quality control in order to guarantee superior results in both the plastic and hardened concrete.

Where to Use Sika® Air 260 is designed for use in exterior concrete such as highway paving, curb and gutters, sidewalks, driveways, slabs, walls, or other areas needing protection from freeze/thaw damage or the harmful effect of de-icing salts. Sika® Air 260 is effective in increasing the workability of the concrete, especially in lean or harsh mixes.

- Advantages**
- Superior resistance to freeze/thaw cycles and scaling.
 - Improves workability.
 - Reduces bleeding.
 - Improves appearance of architectural concrete.
 - Reduces size and number of capillary channels, increasing impermeability.
 - Increased compressive strength in lean mixes.
 - Substantially increased durability.
 - Increases moisture retention for cement hydration.
 - Superior air-void system.

Standards Sika® Air 260 meets or exceeds the requirements of ASTM C260 and CSA A23.1-00.

Typical Data	
Packaging	205 L (54 US gal.) drum 1040 L (275 US gal.) IBC Bulk delivery
Colour and Form	Light brown liquid
Shelf Life and Storage	1 year when stored in dry warehouse conditions between 5 - 27°C (40 - 80°F). Store at above 5°C (40°F). If frozen, thaw and agitate thoroughly to return to normal state. Protect from direct sunlight.
Properties	
Specific Gravity	Approx 1,008

How to Use

Dosage The recommended dosage range for Sika® Air 260 is 7 - 400 mL/100 kg of cementitious material. The nature of various concrete materials, slump, ambient air temperature, mineral additions, mixing time and energy will affect dosage rates. It is suggested that trial batches be conducted in order to determine the required dosage to obtain the required percentage of entrained air. In addition, a regular program of air tests should be instituted in order to adjust the dosage to changing conditions. Contact your Sika Canada Technical Sales Representative for further information.

Mixing For best results, it is recommended to dispense Sika® Air 260 into the batched water or with the aggregates. Sika® Air 260 is compatible with other Sika® admixtures. However, each admixture should be added separately to the mixer.



Construction

Clean Up Use personal protective equipment (chemical resistant goggles/gloves/clothing). Without direct contact, remove spilled or excess product and place in suitable sealed container. Dispose of excess product and container in accordance with applicable environmental regulations.

Health and Safety Information For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the **most recent Material Safety Data Sheet** containing physical, ecological, toxicological and other safety-related data.

KEEP OUT OF REACH OF CHILDREN
FOR INDUSTRIAL USE ONLY

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Other locations
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Vancouver

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www.sika.ca

An ISO 9001 certified company
Pointe-Claire: ISO 14001 certified EMS

Sika® Plastocrete® 161^{CA}

Water-Reducing, Polymer-Type and Non-Corrosive Admixture

Description	Sika® Plastocrete® 161 ^{CA} is a water reducing, polymer based admixture for concrete. Sika® Plastocrete® 161 ^{CA} is a highly purified and concentrated multi-component admixture. It contains no chlorides.
Where to Use	Sika® Plastocrete® 161 ^{CA} is designed for use in all types of concrete where a water reducing, strength increasing admixture is required.
Advantages	Sika® Plastocrete® 161 ^{CA} improves the performance of concrete in the plastic and hardened state providing: <ul style="list-style-type: none"> ■ Improved workability ■ Improved finishing characteristics ■ Improved durability and permeability ■ Increased flexural and compressive strength ■ Reduced segregation and cracking ■ Improved formed surfaces
Standards	Conforms to : <ul style="list-style-type: none"> ■ ASTM C494, TYPE A ■ AASHTO M-194, TYPE A

Typical Data	
Packaging	20 L (5.2 US gal.) pail 205 L (54 US gal.) drum 1040 L (275 US gal.) IBC Bulk delivery.
Colour and Form	Dark brown liquid
Shelf Life and Storage	1 year when stored in dry warehouse conditions between 10 - 27°C (50 - 80°F). Store at above 5°C (40°F). If frozen, thaw and agitate thoroughly to return to normal state before use
Properties	
Specific Gravity	Approx. 1.2

How to Use	
Dosage	Sika® Plastocrete® 161 ^{CA} is normally added to the concrete at a rate of 250 - 500 mL/100 kg of cementitious material. Specific dosage requirements will be dependent on local materials and the intended use of the concrete. Please contact your Sika Canada Technical Sales Representative for further information.
Mixing	Sika® Plastocrete® 161 ^{CA} is compatible with air entraining admixtures and super-plasticizers. Sika® Plastocrete 161 ^{CA} should be dispensed separately with the water at the time of batching. Do not mix directly with other admixtures.
Clean Up	Use personal protective equipment (chemical resistant goggles/gloves/clothing). Without direct contact, remove spilled or excess product and place in suitable sealed container. Dispose of excess product and container in accordance with applicable environmental regulations.
Health and Safety Information	For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

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Construction



Sika® ViscoCrete® 2100

High Range Water Reducing Admixture

Construction

Description Sika® ViscoCrete® 2100 is a high range water reducing and superplasticizing admixture utilizing Sika's ViscoCrete® polycarboxylate polymer technology.

Where to Use

- Sika® ViscoCrete® 2100 may be used in both ready-mix and precast applications, as a plant added high range water reducer to provide excellent plasticity while maintaining slump for up to 90 minutes. Controlled set times make Sika® ViscoCrete® 2100 ideal for horizontal and vertical applications.
- Sika® ViscoCrete® 2100 is ideal for production of Self-Consolidating Concrete (SCC).

Advantages **Water Reduction:** Sika® ViscoCrete® 2100 can be dosed in small amounts to obtain water reduction from 10 - 15% and will achieve water reduction up to 45% at high dosage rates. Sika® ViscoCrete® 2100 is suitable for all levels of water reduction.

High Plasticity: The superplasticizing action of Sika® ViscoCrete® 2100 provides high-slump, flowing concrete that maintains excellent workability and may be placed with minimal vibration even at very low water cement ratio's as low as 0.25.

Sika® ViscoCrete® 2100 plasticized concrete is highly fluid while maintaining complete cohesion within the concrete matrix to eliminate excessive bleeding or segregation.

Extended Slump Life and Set Control: Sika® ViscoCrete® 2100 has been formulated to provide controlled and predictable extended slump life for periods of 60 to 90 minutes with normal set times.

The combined high range water reduction and superplasticizing action of Sika® ViscoCrete® 2100 provide the following benefits in hardened concrete:

- Higher ultimate strengths allow for greater engineering design flexibility and structural economies.
- Reduced water cement ratios produce more durable, dense concrete with reduced permeability.
- Highly effective plasticizer reduces surface defects in concrete elements and improves aesthetic appearance.

It has been formulated to provide maximum water reduction and extended slump retention at low dosages.

- Approved by the Ontario Ministry of Transportation.
- Approved by the Ministère des Transports du Québec.

Standards Sika® ViscoCrete® 2100 meets the requirements for ASTM C494 Types A and F and AASHTO M-194 Type A and F.

Typical Data	
Packaging	205 L (54 US gal.) drum 1040 L (275 US gal.) IBC container Bulk delivery
Colour and Form	Light blue liquid
Shelf Life and Storage	1 year when stored in dry warehouse conditions between 10 - 27°C (50 - 80°F). Store at above 2°C (35°F). If frozen, thaw and agitate thoroughly to return to normal state.
Properties	
Specific Gravity	Approx. 1.08



How to Use

Dosage

Dosage rates will vary according to materials used, ambient conditions and the requirements of a specific project. Sika recommends dosage at 130 - 390 mL/100 kg of cementitious for conventional concrete applications. If high slump or Self-Consolidating Concrete (SCC) is required, dosage from 390 - 780 mL/100 kg of cementitious may be used.

Dosage rates outside the recommended range may be used where specialized materials such as microsilica are specified, extreme ambient conditions are encountered or unusual project conditions require special consideration. Please contact your Sika Canada Technical Sales Representative for more information and assistance.

Curing

Proper curing according to ACI guidelines should be always followed to achieve maximum possible quality of concrete.

Mixing

For best superplasticizing results, add Sika® ViscoCrete® 2100 directly to freshly mixed concrete in the concrete mixer at the end of the batching cycle. Sika® ViscoCrete® 2100 may also be dispensed as an integral material during the regular admixture batching cycle, or into freshly mixed concrete in a ready-mix truck, at the concrete plant or at the job site. To optimize the superplasticizing effect after the addition of Sika® ViscoCrete® 2100, Sika recommends that the combined materials be mixed for 60 - 80 revolutions either in the concrete mixer or in the ready-mix truck.

Combination with other admixtures: Sika® ViscoCrete® 2100 is highly effective as a single admixture or in combination with other Sika admixtures. If used in combination with certain Sikament® high range water reducers it may affect the plastic properties of fresh concrete. Please contact your Sika Canada Technical Sales Representative for further information.

Combination with microsilica: Sika® ViscoCrete® 2100 is particularly well suited for use with microsilica because of its water reduction capability. Do not introduce Sika® ViscoCrete® 2100 directly onto dry cementitious materials.

Clean Up

Use personal protective equipment (chemical resistant goggles/gloves/clothing). Without direct contact, remove spilled or excess product and place in suitable sealed container. Dispose of excess product and container in accordance with applicable environmental regulations.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the **most recent Material Safety Data Sheet** containing physical, ecological, toxicological and other safety-related data.

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Appendix 4

Innovative Civil Constructors Inc

Environmental Policy and Procedures





INNOVATIVE
CIVIL
CONSTRUCTORS INC.

PIGEON RIVER BRIDGE CONSTRUCTION

Environmental Protection Plan



APPLICATION:

This policy applies to all managers, supervisors, employees, agents and subcontractors in our employ or under contract with our firm.

PURPOSE:

The purpose of this section is to establish the basic principles of our efforts to protect the environment.

POLICY:

Innovative Civil Constructors Inc. (ICCI) recognizes and accepts the responsibilities entrusted to us by our clients, and strive to conduct our operations in a socially, economically and environmental manner. Therefore, Innovative Civil Constructors Inc. is dedicated to excellence in implementing standards of care that not only comply with Federal, Provincial and Local requirements but also respond to the social, economic and environmental expectations of our employees, communities, clients, owners, government and the public.

ICCI is committed to the continual improvement of our environmental policies and the prevention of pollution to our environment. Compliance with all relevant legislation and client/owner specific regulations is paramount to our operations.

As a rule, every working system and work procedure within our company will have taken environmental concerns into account prior to formalizing the policy or procedure. Each workplace we work in may have differing environmental concerns so it is essential to understand the need to address these issues on a priority basis.

The cornerstones of ICCI's environmental policy are as follows:

Employ strong leaders and empower each with the authority, responsibility and accountability for decisions and results associated with environmental issues.

Strive to use the best technology and provide products that will be as sensitive as possible to humans, animals, plants and the environment.

Selecting and using economically feasible substances, articles and processes which cause the least impact to the environment.

Ensuring that company and corporate activities minimize environmental impact and contribute to a sustainable future through conservation of natural resources.

Promote pollution prevention and waste minimization activities.



Endeavors to follow environmental rules and regulations, encourage environmental protection activities and ensure the wellbeing of employees and citizens by practicing sound environmental management.

Encourage environmental awareness for all employees at every level so that environmental factors are considered in the decision making process.

Promoting conservation awareness and environmental stewardship in the communities in which we live and operate.

Address all contractual and regulatory requirements.

Constantly, monitor and upgrade our environmental policies and employee training.

Specific Procedures:

- Fuel and Fuel Storage
- Material and Equipment Storage
- Waste Management
- Environmental training, education and awareness
- Erosion and Sediment Control
- Spill Response and Reporting
- Vehicle and Equipment Maintenance

Fuel and Fuel Storage

Always:

- Fuel bulk tank will be installed over a collecting bed as per special requirement
- Fuel carefully to minimize drips to the ground surface.
- Maintain clean fuel dispensing areas using dry cleanup methods.
- Utilize fueling safeguards. Clearly label and tag all valves to reduce human error.
- Train employees on proper fueling methods and spill cleanup techniques.
- Maintain fuel storage tanks in accordance with local, provincial and federal laws.
- Have absorbent spill cleanup kits and materials available at fueling areas.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials
- A portable purpose made leak proof pan will be placed under vehicles or equipment fuel tanks during fueling from bulk tanks or mobile cubes. Any collections will be immediately cleaned with absorbent media and contained for proper disposal



Whenever Possible:

- Regularly inspect fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.
- Use designated fueling areas.
- Design fueling areas to minimize storm water exposure. Prevent run-off and ponding of water, and use secondary containment systems.

- Protect storm drains from fueling areas using berms and dikes.
- Use drip pans or absorbent pads during fueling to collect leaks.
- Add automatic shutoff mechanisms to fueling equipment.
- Install protective guards around fueling equipment, tanks, and piping to prevent collisions.

Never:

- “Top off” fuel tanks.
- Hose down or bury a fuel spill.

Material and Equipment Storage

Hazardous materials must be stored based on their compatibility, not simply in alphabetical order. Store materials of the same hazard together i.e. flammables with flammables and oxidizers with oxidizers.

Hazardous substances should be stored in an orderly manner with older products most accessible and the newer products least accessible. Good housekeeping must be practiced in areas where hazardous products are stored.

All hazardous materials must be properly labeled including their exact contents, hazardous properties, date of receipt, and if appropriate, date of expiration.

Hazardous substances should be stored in original containers in which they were packaged at the manufacturing plant. If this is not practical, these products should be transferred according to manufacturers' recommendations into containers that are constructed to withstand the effects of the product over the maximum storage time.

Incompatible materials must not be stored such that they may come in contact with each other. If incompatible materials are allowed to mix dangerous conditions will result. Combining these materials may result in the following:

- heat or pressure;
- fire or explosion;
- violent reaction;
- toxic dusts, mists, vapors, or gases;
- Flammable vapors or gases.



Always:

- Store materials away from high traffic areas.
- Store materials according to manufacturer's specifications (e.g. in a flammable materials storage cabinet).
- Dispose of unused or waste materials properly.
- Train employees on proper storage procedures for petroleum and chemical products.
- Store materials in their original containers to maintain appropriate labeling.
- Be prepared for spills by having a spill kit nearby.
- Frequently inspect the storage areas for leaks or spills.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.
- Train employees in hazardous material handling, safety, spill cleanup and reporting on an annual basis.
- Handle petroleum products and chemicals according to manufacturer's specifications.
- Use proper protective equipment.
- Maintain Material Safety Data Sheets (MSDS) for all chemicals used.
- Make MSDS sheets available on materials that require special handling, storage and/or disposal.

Never:

- Never store petroleum or chemical products near a floor drain or storm water inlet.
- Never treat or dispose of hazardous materials unless licensed to do so.
- Never mix petroleum or chemicals unless directed by manufacturer's instructions.

Waste Management

Objectives:

All waste generated during construction activities is to be disposed of in an acceptable manor.

Waste and construction by-products are to be kept to a minimum.

Waste materials suitable for recycling will be separated from the waste and diverted to the appropriate recycling facility.

Reduce, Reuse and Recover any materials deemed recyclable.

Where feasible use materials that are made from recycled products.

Reduce the creation of waste materials that cannot be recycled.



Dispose of un-recyclable waste materials in an environmentally sound manner ensuring full compliance with all relevant legislation.

General Construction Waste

All waste that will be retained on site for a period of time will be transported and stored in the waste disposal area. Materials suitable for recycling will be transported to an approved recycling depot, all non-recyclable materials will be disposed of at an authorized landfill.

Permanent disposal of wastes from the waste disposal area as detailed above will be completed on a regular basis. Frequency of clean outs will depend on stage of work and amount of waste being generated.

Hazardous Wastes

Hazardous wastes will be transported and disposed of at an approved facility. Transportation of materials will be as per WHMIS & TDG guidelines.

Filters, containers, drums and barrels that were used in the storage of, or came into contact with hazardous materials are to be recycled (as applicable) or disposed of in at an authorized facility.

Whenever Possible:

- Store garbage containers beneath a covered structure or inside to prevent contact with storm-water.
- Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
- Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.
- Keep bins free of improperly discarded trash.
- Provide training to employees to prevent improper disposal of general trash.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Request/use dumpsters without drain holes.

Never:

- Never place hazardous wastes in a dumpster or trash bin.



Erosion & Sediment Control

Protection of our streams and waterways is paramount to Innovative Civil Constructors Inc.'s environment policy.

ICCI seeks to prevent pollution to our streams and rivers by:

Minimizing disturbance: Preserve existing vegetation, seed bare soil immediately, and place sod or final seed with erosion control mats as soon as possible.

Containing Sediment: Install silt fence, protect surface water inlets, place mulch, blankets, and mats over disturbed areas, install ditch checks, and use sediment basins and traps.

Removing Sediment:

Clean out sediment traps and sweep construction access areas.

Always:

- Use erosion control techniques or devices to stabilize disturbed areas.
- Use effective site planning to avoid sensitive areas.
- Keep land disturbance to a minimum.
- Inspect and maintain erosion control devices.
- Install erosion control devices properly.

Whenever Possible:

- Protect disturbed areas from storm-water runoff by using stabilizers such as mulch.
- Limit construction activities during months with higher runoff rates.
- Assign responsibility for maintaining erosion control devices.
- Reduce the velocity of storm-water runoff.
- Divert clean water away from the disturbed area during construction activities.
- Protect vegetative buffers or create new ones.

Never:

- Never divert runoff into a sensitive area.

Spill Response and Reporting

Always:

- Stop the source of the spill.
- Contain any liquids.
- Contact the appropriate regulatory agency to report any size spill.



- Cover the spill with absorbent material such as kitty litter, sawdust, or oil absorbent pads. Do not use straw. Dispose of used absorbent material properly.
- Use water only when necessary and minimize use.
- Contact municipal officials.
- Fit petroleum and chemical storage containers with secondary containment structures.
- Keep a spill kit in areas where petroleum or hazardous materials are stored.
- Train employees in spill response procedures and equipment.
- Deploy containment booms if spill could potentially reach a storm drain or waterbody.
- Position mats to contain drips from equipment or vehicles until they can be repaired.

Never:

- Never wash a spill into the storm drain or a water body.
- Never leave a spill without cleaning it up.

Equipment and Equipment Maintenance

Prior to bringing equipment on site and at regular daily intervals during construction, equipment will be inspected to ensure it is in good working order, by the operator and documented.

The operator will bring onto site, in suitable trucks and containers, the fuel lubricants and antifreeze required for maintaining equipment. No on site storage of these materials is anticipated.

A designated refueling and maintenance area will be established on site. All refueling and equipment maintenance will be completed at this location. The refueling area will be established at a location such that a minimum distance of 100m from any water course or wetland.

When equipment refueling is required, machine will be transported to designated refueling area.

Nozzle is to be attended at all times and will be equipped with an automatic shutoff to prevent overflows/spills. When refueling has been completed, fuel is to be properly sealed and returned to designated storage location.

A spill kit will be on site to help contain and clean up should a spill occur. Spill kit will be model #SK-U30 as manufactured by BIG O INC; a universal kit with a 96 liter capacity.

A collection boom will be placed around stationary in water equipment .

The Emergency Spill Procedure will be followed in the event of a major spill.

Equipment Clean Out: all equipment, as required, will be cleaned at waste storage areas. A filter fence will be placed as to prevent any debris produced in waste storage area from entering any of the surrounding watercourses. The waste storage area will be located as to not impact drainage of the site.

Any soil contaminated will be stockpiled and contained accordingly. Contaminated soil will be disposed of at a suitable location and in a suitable manner.



Wetlands

Wetlands are defined as land that has the water table at, near, or above the land surface, or which is saturated for long enough periods to promote wetland or aquatic processes (National Wetlands Working Group, 1988). Wetlands include bogs, fens, swamps, and marshes. Wetlands are valuable natural resources providing habitat for a variety of wildlife and plant species, both aquatic and terrestrial. For these reasons, the preservation of wetlands through highway design and construction practices is important.

For the construction of the Pigeon River Bridge, the following practices will be used at wetlands to protect wildlife and habitat, and to minimize effects on drainage and water quality:

- (a) Travel on wetlands shall be avoided wherever possible. Access roads shall avoid all important wetlands where possible.
- (b) Activities will be timed to coincide with low water or frozen conditions, where possible
- (c) Crossings will be restricted to a single location and will occur perpendicular to and at a narrow point on the wetland. Brush matting, swamp matting, ice bridges and floatation tires on vehicles shall be used when crossing as dictated by site conditions and the Project Engineer.
- (d) Equipment shall be in good working order and free of leaks. No equipment maintenance including fueling shall be carried out within 30 m of a wetland.
- (e) Excavation in wetlands shall be carried out by an excavator operating from a dry stable surface to minimize sediment generation.
- (f) Excavate only what is absolutely necessary to meet engineering requirements. Excavated material shall not be side cast in the wetland.
- (g) Vegetation will be retained where possible to provide wildlife habitat. Where applicable, no work near wetlands will be scheduled during the wildlife's breeding season.

Watercourses

Watercourses are defined as the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not.

Innovative Civil Constructors is committed to the protection of fish and fish habitat. General protection measures for watercourses are.

1. Plan in-stream works so that the contact time is minimized.
2. Establish special practices so that impacts on the waterway and disturbance of its banks are minimized.
3. Stabilize banks and in stream structure so that they do not contribute to the sediment load.



4. Maintain minimum flows to ensure the viability of aquatic communities and ensure that there are no barriers to the passage of fish up and downstream.
5. Avoid times of the year when environmental damage is expected to be highest.
6. Construct in-stream crossings during low flows, designed to be stable under expected vehicle loads and flow regimes that do not contribute to the sediment load in the stream.
7. Design crossings so that drainage off the crossing does not contribute sediment load to the stream.
8. Prepare a contingency plan for high-rain events.
9. Prepare a reinstatement plan if work in a stream is planned or the structure of a waterway will be altered.

Wildlife

In the planning of the Pigeon River Bridge Construction, all sensitive wildlife habitat has been avoided where possible. General protection measures that apply during construction include:

- (a) Innovative Civil Constructors employees and Contractor employees and agents shall not interfere with wildlife
- (b) Where important wildlife species are encountered impacts shall be minimized by avoiding noisy, disruptive activities during sensitive wildlife periods.
- (c) No one shall disturb, move or destroy migratory bird nests. If a nest or young birds are encountered, the Contractor shall cease work in the immediate area of the nest and contact HSE and the Project Engineer;



- (d) The Contractor shall consult with the Regional Wildlife Biologist to determine appropriate measures for removing beaver dams and/or nuisance beavers
- (e) All refuse shall be disposed of at an approved landfill facility. Refuse stored on site prior to removal shall be stored in closed containers; and
- (f) Report any nuisance wildlife to the Project Engineer.

Habitat for Species at Risk and Rare Species

Innovative Civil Constructors has mitigated the impact on species at risk and rare species through avoidance.

If designated species at risk are encountered during construction, the Project Engineer and Innovated Civil Constructors HSE Group will be notified, and /or Environment Canada contacted for advice. Designated species are listed on both provincial and federal government websites.

http://www.sararegistry.gc.ca/species/default_e.cfm

Heritage Resources

Heritage resources include sites and artifacts of value for their archaeological or historic importance or interest.

No archaeological resources were identified and no further archaeological consideration is warranted for the alignment.

In the event that a heritage or archaeological feature is encountered during construction, the following measures will be taken to protect the feature(s) from further damage:

- (a) All work in the area of the encounter will cease;
- (b) The potential find shall be protected by erection of a snow fence and signed as off limits to construction personnel.
- (c) The Contractor shall contact the Environmental Services Group and the Provincial Archaeologist
- (d) Work at the site will not recommence until permission to proceed has been granted

In the event that human remains are encountered, work will immediately stop and the Police shall be notified



INNOVATIVE
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CONSTRUCTORS INC.

ENVIRONMENTAL

OPERATIONAL PROCEDURES



INNOVATIVE
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Environmental Operational Procedure 1.1

Chemical and Materials Management

A designated storage area for chemical products used on site will be established in a non-hazardous location, complete with secondary containment, emergency spill response kit, and with proper signage. All chemical materials will be handled in accordance with the Occupational Health and Safety Code.

Other requirements are as follows:

1. Hazardous materials must be stored based on their compatibility, not simply in alphabetical order. Store materials of the same hazard together i.e. flammables with flammables and oxidizers with oxidizers.
2. Hazardous substances should be stored in an orderly manner with older products most accessible and the newer products least accessible.
3. Good housekeeping must be practiced in areas where hazardous products are stored.
4. All hazardous materials must be properly labeled including their exact contents, hazardous properties, date of receipt, and if appropriate, date of expiration.
5. Hazardous substances should be stored in original containers in which they were packaged at the manufacturing plant. If this is not practical, these products should be transferred according to manufacturers' recommendations into containers that are intended to withstand the effects of the product over the maximum storage time.
6. Hazardous materials that have been decanted from manufacturer's containers must be provided with a Workplace label containing (at a minimum) the following three pieces of information:
 - a. Product identifier
 - b. Handling instructions (for safety)
 - c. Statement that a MSDS is available for this material.
7. Incompatible materials must not be stored such that they may come in contact with each other.
8. Fit petroleum and chemical storage containers with secondary containment structures in accordance with regulatory requirements.
9. If incompatible materials are allowed to mix dangerous conditions will result. Combining these materials may result in the following:
 - a. heat or pressure;
 - b. fire or explosion;

- c. violent reaction;
- d. toxic dusts, mists, vapors, or gases;
- e. flammable vapors or gases.

Operational Procedures

- Store materials away from high traffic areas.
- Store materials according to manufacturer's specifications (e.g. in a flammable materials storage cabinet).
- Dispose of unused or waste materials properly.
- Store materials in their original containers to maintain appropriate labeling.
- Be prepared for spills by having a spill kit nearby.
- Inspect daily, the storage areas for leaks or spills.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.
- Train employees on proper storage procedures for petroleum and chemical products.
- Train employees in hazardous material handling, safety, spill cleanup and reporting on an annual basis.
- Handle petroleum products and chemicals according to manufacturer's specifications.
- Use proper protective equipment.
- Maintain Material Safety Data Sheets (MSDS) for all chemicals used.
- Make MSDS sheets readily available on materials that require special handling, storage and/or disposal.
- Never store petroleum or chemical products near a floor drain or stormwater inlet.
- Never treat or dispose of hazardous materials unless licensed to do so.
- Never mix petroleum or chemicals unless directed by manufacturer's instructions.

Training

All field staff will be provided with WHMIS training, a review of our Environmental Policy and operational procedures, as well as a copy of the ICCI Environmental Policy and Operational procedures.

Environmental Operational Procedure 1.2

Vehicle and Equipment Operation, Maintenance and Refueling

Construction traffic may have a significant impact on noise and traffic congestion in built-up areas. Traffic control signage will be installed to advise the public of work activity durations.

Prior to bringing equipment on site and at regular daily intervals during construction, equipment will be inspected by the operator to ensure it is in good working order, and the inspection documented.

All equipment will be inspected for weeds and weed seeds prior to entering site. Equipment will be cleaned of all dirt, debris, and weeds prior to access being granted.

Heavy equipment will not operate on original ground prior to stripping of topsoil.

The operator will bring onto site, in suitable trucks and containers, the fuel lubricants and antifreeze required for maintaining equipment.

A designated refueling and maintenance area will be established on site. All refueling and equipment maintenance will be completed at this location. The refueling area will be established at a location such that a minimum distance of 100m from any water course or wetland is maintained.

When equipment refueling is required, the machine will be transported to the designated refueling area.

When refueling the nozzle is to be attended at all times and will be equipped with an automatic shutoff to prevent overflows/spills. When refueling has been completed, fuel is to be properly sealed and returned to designated storage location.

A spill kit will be on site to help contain and clean up should a spill occur. The spill kit will be Part No. SK-HAZ-D55 by Roughneck distributed by Greggs Distributors Ltd.; a universal kit with a 55 gallon (208.2L) capacity or similar. The spill kits will be clearly marked with signage. Equivalent quantities of spills kits will be provided depending upon the quantity of liquid stored.

The Emergency Spill Procedure (see Environmental Operating Procedure 1.5) will be followed in the event of a major spill.

Equipment Clean Out

All equipment, as required, will be cleaned at waste storage areas. A filter fence will be placed as to prevent any debris produced in waste storage area from entering any of the surrounding watercourses. The waste storage area will be located as to not impact drainage of the site.

Any soil contaminated will be stockpiled and contained accordingly. Contaminated soil will be disposed of at a suitable location and in a suitable manner.

Fire extinguishers and spill kits will be located at all refueling locations and work areas onsite.

Fuel/propane storage tanks will be protected from impact and provided with secondary containment to meet Fire Code requirements.

Training

All field staff will be provided with WHMIS training, a review of our Environmental Policy and operational procedures, as well as a copy of the ICCI Environmental Policy and Operational procedures.

Refueling Procedure

- Refuel carefully to minimize drips to the ground surface.
- Maintain clean fuel dispensing areas using dry cleanup methods.
- Utilize fueling safeguards. Clearly label and tag all valves to reduce human error.
- Train employees on proper fueling methods and spill cleanup techniques.
- Maintain fuel storage tanks in accordance with local, provincial and federal laws.
- Have absorbent spill cleanup kits and materials available at fueling areas.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.
- Inspect weekly, fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.
- Use designated fueling areas.
- Design fueling areas to minimize stormwater exposure. Prevent run-off and ponding of water, and use secondary containment systems.
- Protect storm drains from fueling areas using berms and dikes.
- Use drip pans or absorbent pads during fueling to collect leaks.
- Add automatic shutoff mechanisms to fueling equipment.
- Install protective guards around fueling equipment, tanks, and piping to prevent collisions.

Environmental Operational Procedure 1.3

Waste Management & Reduction

We are committed to using, storing and disposing of products in such a manner that will provide appropriate protection to the environment. Where possible, we shall recycle and promote the use of recycled products.

We strive to minimize the generation of waste on our projects and to maintain the following waste management objectives:

1. All waste generated during construction activities is to be disposed of in an acceptable manner.
2. Waste and construction by-products are to be kept to a minimum.
3. Waste materials suitable for recycling will be separated from the waste and diverted to the appropriate recycling facility.
4. Reduce, Reuse and Recover any materials deemed recyclable.
5. Where feasible use materials that are made from recycled products.
6. Reduce the creation of waste materials that cannot be recycled.
7. Dispose of un-recyclable waste materials in an environmentally sound manner ensuring full compliance with all relevant legislation.

Concrete Rubble/Waste

All concrete rubble (including dried concrete waste) is to be transported to an appropriate facility for recycling.

Concrete truck wash water is to be contained in a designated area away from water courses or disposed of at the plant.

General Construction Waste

All waste that will be retained on site for a period of time will be transported and stored in the waste disposal area. Materials suitable for recycling will be transported to an approved recycling depot; all non-recyclable materials will be disposed of at an authorized landfill.

Permanent disposal of wastes from the waste disposal area as detailed above will be completed on a regular basis. Frequency of clean outs will depend on stage of work and amount of waste being generated.

Hazardous Wastes

Hazardous wastes will be transported and disposed of at an approved facility. Transportation of materials will be as per WHMIS & TDG guidelines.

Filters, containers, drums and barrels that were used in the storage of, or came into contact with hazardous materials are to be recycled (as applicable) or disposed of in at an authorized facility.

Operational Procedures

- Store garbage containers beneath a covered structure or inside to prevent contact with stormwater.
- Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
- Inspect garbage bins for leaks weekly, and have repairs made immediately by responsible party.
- Keep bins free of improperly discarded trash.
- Provide training to employees to prevent improper disposal of general trash.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Request/use dumpsters without drain holes.
- Never place hazardous wastes in a dumpster or trash bin.

Training

All field staff will be provided with WHMIS training, a review of our Environmental Policy and operational procedures, as well as a copy of the ICCI Environmental Policy and Operational procedures.

Environmental Operational Procedure 1.4

Erosion & Sediment Control

All sites and projects will be evaluated and where warranted a site-specific Environmental Constructional Operation (ECO) plan will be prepared following the owners guidelines. The plan will be prepared and identify the location and details of all erosion and sediment controls required.

We are committed to implementing the erosion and sediment control objectives as follows:

1. Minimizing disturbances: preserve existing vegetation, maintain designated setbacks from streams or environmental preserves
2. Protect Water courses and stabilize drainage swales. Install silt fences along perimeter of water courses.
3. Stage construction to limit exposure of bare soils to minimize erosion potential.
4. Stabilize exposed soils as soon as possible by seeding, placing sod, mulch or erosion control mats.
5. Protect steep slopes and cuts by avoiding working on these slopes as much as possible and diverting upgradient drainage or installing silt fencing.
6. Install perimeter controls to filter runoff before it leaves the site.
7. Be prepared for storms or other high discharge events that may require additional measures such as settling basins or traps.
8. Ensure all site personnel including sub-contractors are trained on erosion and sediment control implementation, inspection, maintenance and repairs.
9. Modify the erosion and sediment control to suit site conditions.
10. Review erosion and sediment control effectiveness after storm events.
11. Maintain and repair erosion and sediment control installations promptly.

Operational Procedures

Minimizing Disturbances

- Use effective site planning to avoid sensitive areas.
- Phase construction operations to keep land disturbance to a minimum.
- Limit construction activities during months with higher runoff rates.
- Protect vegetative buffers or create new ones.
- Protect steep cuts, particularly 6H:1V to 3H:1V or greater, by minimizing activity and flow diversion if possible.

Erosion and Sediment Controls Installation

- Obtain discharge and dewatering permits from applicable authorities.
- Use erosion control techniques or devices to stabilize disturbed areas.
- Install erosion control devices properly, particularly keying in to the proper depth below grade.
- Protect disturbed areas from stormwater runoff by using stabilizers such as mulch.
- Reduce the velocity of storm water runoff by the use of ditch checks or other devices as necessary.
- Divert clean water away from the disturbed area during construction activities.
- Never divert runoff into a sensitive area.
- For large velocity areas, install appropriate armouring, sediment basins and traps.

Erosion and Sediment Controls Maintenance & Repair

- Assign responsibility for maintaining erosion control devices.
- Carry out regular inspections at least weekly or after severe storm events with the ESC Inspection and Maintenance Record.
- Clean out sediment traps and sweep construction access areas.
- Make any adjustments necessary to increase erosion and sediment control effectiveness.
- Dispose of contained sediment properly in accordance with regulatory requirements.

Training

All field staff will be provided with WHMIS training, a review of our Environmental Policy and operational procedures, as well as a copy of the ICCI Environmental Policy and Operational procedures.

Environmental Operational Procedure 1.5

Substance Release Response and Reporting

Emergency Spill Response Procedure

- Stop the source of the spill.
- Contain any liquids.
- Call 911 if spill cannot be contained
- Cover the spill with absorbent material such as kitty litter, sawdust, or oil absorbent pads. Do not use straw. Dispose of used absorbent material properly.
- Use water only when necessary and minimize use.
- Deploy containment booms if spill could potentially reach a storm drain or waterbody.
- Position mats to contain drips from equipment or vehicles until they can be repaired.
- Never wash a spill into the storm drain or a water body.
- Never leave a spill without cleaning it up.

Reporting Procedure

- Any staff noticing a substance release shall notify immediate supervisor and/or site supervisor or designate.
- Upon a substance release the Innovative Civil Constructors Inc. site representative will notify the site determined regulatory agencies; the Owner's project team representative will be notified immediately.
- The site representative will document the spill and response event and produce a report for review.
- Innovative Civil Constructors Inc. management will review the incident reports and determine if procedures need to modify or additional training provided.

Training

All field staff will be provided with WHMIS training, a review of our Environmental Policy and operational procedures, as well as a copy of the ICCI Environmental Policy and Operational procedures.

Environmental Operational Procedure 1.6

Environmental Training, Education and Awareness

All field staff will be provided with WHMIS training, a review of our Environmental Policy and operational procedures, as well as a copy of the ICCI Environmental Policy and Operational procedures.

Innovative Civil Constructors Inc. provides internal environmental awareness training to Site Supervisors that includes:

- Environmental Policy
- Roles and responsibilities for maintaining environmental procedures
- Potential consequences of departure from specified procedures
- Emergency procedures and forms
- Regular updates, including lessons learned.

The Environmental Policy is communicated to all workers at every project orientation meeting. All workers at site, including subcontractors must attend these meetings.

Various environmental matters (including lessons learned) are also communicated during regular (minimum weekly) tool-box meetings.

Designated company representatives are to complete the Construction Environmental Awareness training.

Spill Control Products

55 GALLON DRUM KITS

Kits come complete with the following:

- 65 - Gallon UN/DOT Drum with lid
- 60 - heavy weight absorbent pads (15" x 18")
- 10 - Absorbent 3" x 4 ft. Socks
- 7 - Absorbent 3" x 8 ft Socks
- 6 - 18" x 18" Pillows
- 1 - Pair Nitrile Gloves
- 5 - Disposable bag with Tie
- 1 - Instruction Sheet

Part No. SK-OIL-D55.

Part No. SK-UNI-D55.

Part No. SK-HAZ-D55.



95 GALLON DRUM KITS

Kits come complete with the following:

- 95 - Gallon UN/DOT Drum with lid
- 100 - heavy weight absorbent pads (15" x 18")
- 16 - Absorbent 3" x 4 ft. Socks
- 10 - 3" x 8 ft. socks
- 8 - 18" x 18" pillows
- 4 - 5lb bags of loose absorbent
- 2 - Pair Nitrile Gloves
- 2 - Pairs of safety goggles
- 5 - Disposable bag with Zip Tie
- 1 - Emergency Response Guidebook

Part No. SK-OIL-D95.

Part No. SK-UNI-D95.

Part No. SK-HAZ-D95.



Containment Products

PORTABLE CONTAINMENT BERMS

These units fold up for easy storage and quickly unfold when needed. Great for use where required by law for trucks utilizing ice roads in northern parts of the country. Constructed of high strength PVC material and are a high viz yellow, one-piece containment vessel. Great for drum storage, under fuel tanks, safe with gas, diesel, oil, brake fluid, antifreeze, and mild acids. Temperature range: -65°F to 135°F.

Part No. BERM-226, 2 ft. x 2 ft.

Part No. BERM-336, 3 ft. x 3 ft.

Part No. BERM-446, 4 ft. x 4 ft.

Part No. BERM-556, 5 ft. x 5 ft.



folds up for easy storage!

•REUSABLE •LIGHTWEIGHT •DURABLE



ESC Inspection and Maintenance Record

Date: _____ Project/Location: _____

Developer: _____ Contractor: _____

Consultant: _____ Inspector Name (Print): _____

Weather (current & last 48 hours): _____

STAGE OF CONSTRUCTION FOR INSPECTION/PROJECT AREA

Inspection Checklist (Mark the appropriate boxes with a ✓ or a note)	YES	NO	N/A	NOTES
Are the approved and up to date ESC report and/or drawings available on-site? Is an inspection/maintenance log being maintained for the site?				
Are appropriate measures in place to control overland run-on and run-off? (Clean run-on/run-off diverted around disturbed areas and dirty run-off contained)				
Are contractors staying within the approved construction limits?				
Are all stockpiles adequately located and stabilized (i.e. located on flat areas, with containment and application of temporary cover if pile exists > 30 days)?				
Have all disturbed areas requiring temporary or permanent stabilization been stabilized with appropriate erosion controls?				
Where possible, is sediment intercepted and controlled close to the source?				
Drainage/Dewatering of impounded water to a storm sewer: Does contractor have a valid drainage permit and are all permit conditions being adhered to?				
Are all entry points to the underground storm drainage system adequately protected (on-site and adjacent to site)?				
Are all perimeter controls properly installed and maintained to ensure sediment does not leave the site?				
Are soil and mud being kept off all adjacent roadways? Are construction exits properly stabilized and maintained?				
In dry conditions, is dust adequately controlled on stockpiles and exposed areas?				
In areas where construction is complete, are permanent stabilization measures adequate?				
Have all temporary controls that are no longer needed been removed within 30 days of final site stabilization?				

ESC Inspection and Maintenance Record

TYPE OF CONTROL	General Condition Of ESC Measure	General Performance Of ESC Measure	Maintenance Required?	Completion Date	Notes (locations, photos)
Run-on/Run-off:					
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
Erosion Controls:					
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
Sediment Controls:					
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		
	poor/fair/good	poor/fair/good	Yes/No		

INSPECTOR SIGNATURE: _____

DATE (YYYY/MM/DD): _____

Records should be kept for three years after final site stabilization.



SPILL REPORTING INFORMATION FORM

Person reporting spill:	Telephone number:
Date of reporting:	Time of reporting:
Person causing spill (if known):	Telephone number:
Date of spill:	Time of spill:
Spill location:	
Material type:	
Material quantity:	
Weather conditions:	
Other Agencies contacted: <input type="checkbox"/> Police/Fire Dept. (911) <input type="checkbox"/> Environment Canada (604-666-6100)	
<input type="checkbox"/> Transport Canada (604-666-2955)	
<input type="checkbox"/> Others:	
Cause(s) and effect(s) of spill:	
Spill containment and clean up procedures initiated:	
Description of spill location and surroundings:	
Distance to nearest public facility, residence, First Nations community:	
Distance to nearest stream, water bodies, sensitive areas:	
Other comments/actions taken:	
Report completed by:	Telephone number:
Title:	Date:

Appendix 5

Innovative Civil Constructors Inc

Pictures



Environmental Act Application
SW Sec 19 Twp 38 Rge 5E



Barrens
River

152+000



151+000



150+000



All-Season Road
Centerline with
100m Right-Of-Way



Area of
Immediate
Quarrying



Current aerial view of
proposed location

SW Sec 19 Twp 38
Rge 5E



Berens River

Proposed Batch
Plant Area

Start of R9
Contract



BMH

CAT

BMH

2



Appendix 6

Innovative Civil Constructors Inc

Daily Specific HSE Review Form





Method Statement / Job Hazard Analysis

To be completed prior to beginning any new task or activity

Job Name and # _____

The purpose of the Method Statement / JHA is to facilitate communication about the "At Risks" of the task or job about to be performed.

Post Job Safety Review

1. Was anyone injured or did an unplanned event occur yesterday? Yes No
2. Did any near misses occur? Yes No
If yes, please discuss the method to prevent reoccurrence and ensure that you accurately report the incident.
3. What problems did you have with yesterday's work assignment? _____
4. What can we do today to improve performance? _____
5. Other concerns/comments/suggested improvements: _____
6. Jobsite Safety Rules must be reviewed with the crew daily. Check mark the box that #6 was completed.
7. Have you identified the Main Line Grounds? Yes No If yes, note pole location _____
8. Exact location of work to be done in order to relay 911 if needed (nearest public road access) _____
9. Do you have cellular telephone communication with 911 if needed? Yes

Specific Job/Activity:		Type of Work:	
Date:		Foreman Conducting Meeting:	

List Steps to Perform Work (Identify Hazards and Corrective Actions on Tailboard)

Steps	Hazards	Actions

By signing this document and filling in your employee number, you are agreeing that you understand each "Step", "Hazard" and "Action" listed above.

Signature:	Employee #:
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Signature:	Employee #:
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

Please explain to the crew whether or not the safety and production goals were met yesterday, and share your production goals.



Method Statement / Job Hazard Analysis

To be completed prior to beginning any new task or activity



Reviewed by: _____
 Site Manager / Field Engineer / Site Safety Coordinator

Circle Potential "At Risk" Items

Electrocution/Shock	Hot Surfaces	Driving/Operating Procedures	Repetitive Motion
Compressed Air	Extreme Conditions: Heat/Cold	Eyes on Path	Proper Lighting
Chemicals	Asbestos/Lead/Silica	Line of Fire	Confined Space
Fall From Heights	Pinch Points	Welding Arc	Line Break
Elevated/Overhead Work	Flying Particles	Ascending/Descending	Ergonomics
Manual Lifting & Lowering	Vehicle Traffic	Eyes on Task/Hands	Housekeeping
Rough/Sharp Material	Railway Traffic	Excavation	Noise
Walking/Working Surfaces	Toxic Atmosphere	If You Are Unsure, Get Assistance	Seat Belt Use
Stacking/Storage & Labeling	Flammable Materials	Employees Behavior Resulting From Drug/Alcohol Usage	

Other "At Risks": _____

Corrective Actions Taken to Ensure Safety _____

Identify Required Needs to Reduce "At Risk"

PPE Needed	Y	N
Check Seat Belt Usage		
Face Shield		
Mono goggles		
Hearing Protection		
Gloves for Specific Hazard		
Rubber Boots		
Snake Chaps		
Chemical Suits		
Fall Protection Equip. Inspector Initials:		
Respiratory Protection		
Eye Wash Station Needed		
Spray for Spiders		
Welding Hood/Goggles		
Other (list):		
Permits Required	Y	N
Hot Work		
Line Break		
Roadway		
Personnel Basket		
Confined Space Entry		
Rail Work-Derailer		
Pre-Lift Rigging		
Excavation		
Demolition		
Scaffold		
Other (list):		

Fire Protection	Y	N
Pre-Work Inspection		
Welding Screens		
Flammables Removed		
Suitable Fire Extinguishers		
LEL Measured		
Oxy./Acet. Equip. Secured		
Firewatcher Stationed		
Other (list):		
Barricades Needed	Y	N
Caution (Yellow)		
Danger (Red)		
Hard Barricade		
Floor Openings		
Excavation Secured		
Other (list):		
Cranes	Y	N
Is the crane swing radius properly barricaded with tape or rope?		

Abatements Necessary	Y	N
Asbestos		
Lead Paint		
Other (list):		

Energized Equipment Secured	Y	N
Ground Fault Protection (GFCI)		
Lock Out/Tag Out		
Energy Sources Identified		
Electrical Tool/Cords Inspected		
Current Color Code:		
High Voltage Lines Identified		
Hot Pipes Need Temp. Insulation		
Hot Air Hoses Secured		
Cords, Leads, Hoses Elevated 7 ft.		
Other (list):		
Material Handling Equipment	Y	N
Rigging, Inspector Initials:		
Tag Lines, Inspector Initials:		
Chainfall, Size:		
Come-a-Long, Size:		
Wheelbarrow (2 Wheel)		
Air Tugger		
Crane Needs, Size:		
Powered Industrial Truck/Boom Truck		
Other (list):		
Qualified or DOT Drivers Needed	Y	N
Qualified Driver Pulling Trailers		
Truck and Trailer Over 10,000 lbs = Need a Qualified Driver		
Truck and Trailer of 26,000 lbs = Need a CDL		
Do you need a CDL Driver?		
Do you need a Qualified Driver?		

Identify "At Risk" Employees (New Hires, Employees from Other Crews, Visitors, etc.):



Method Statement / Job Hazard Analysis

To be completed prior to beginning any new task or activity

Safety notes to share with crew from morning meeting:

Appendix 7

Innovative Civil Constructors Inc

Maintenance Review and Log Form



B5 Pigeon River - Batch-plant Checklist

- Daily
- Weekly
- Monthly

<input type="checkbox"/>	Notes	Day	Week	Month	Item
<input type="checkbox"/>					Aggregates
<input type="checkbox"/>					Stockpile foundation condition
<input type="checkbox"/>					Aggregate stockpiled properly
<input type="checkbox"/>					Handling of aggregates
<input type="checkbox"/>					Cement and Fly Ash
<input type="checkbox"/>					Has material been properly sampled?
<input type="checkbox"/>					Are storage facilities adequate?
<input type="checkbox"/>					Have proper certificates been received?
<input type="checkbox"/>					Batching Equipment
<input type="checkbox"/>					Bins and loading hopper checked for conditions and compliance with specifications
<input type="checkbox"/>					All scales checked and calibrated
<input type="checkbox"/>					Sensitivity of scales checked
<input type="checkbox"/>	Notes	Day	Week	Month	Item
<input type="checkbox"/>					Water meter checked for accuracy



B5 Pigeon River - Batch-plant Checklist

<input type="checkbox"/>					Transit mix truck condition
<input type="checkbox"/>					Revolution counter operation
<input type="checkbox"/>					Mix Proportions
<input type="checkbox"/>					Approved mix design received
<input type="checkbox"/>					Size and batch determined
<input type="checkbox"/>					Mix design proportions adjusted for desired air content
<input type="checkbox"/>					Batch Quantities
<input type="checkbox"/>					Dry weights per batch established for:
<input type="checkbox"/>					Sacks or pounds of cement and fly ash
<input type="checkbox"/>					of fine aggregate
<input type="checkbox"/>					Pounds of coarse aggregate
<input type="checkbox"/>					Total water required per batch
<input type="checkbox"/>					Total yield (including air) per batch
<input type="checkbox"/>					Quantity of air entraining agent required per batch
<input type="checkbox"/>					Quantity of other additives required per batch
<input type="checkbox"/>					
<input type="checkbox"/>					
<input type="checkbox"/>					Moisture Content
<input type="checkbox"/>					Percent total moisture for each aggregate
<input type="checkbox"/>	Notes	Day	Week	Month	Item
<input type="checkbox"/>					Gallons of effective moisture per batch



B5 Pigeon River - Batch-plant Checklist

<input type="checkbox"/>					Gallons of water to be added at mixer
<input type="checkbox"/>					Scale Weights per Batch
<input type="checkbox"/>					Cement same as dry weight
<input type="checkbox"/>					Fly ash weight
<input type="checkbox"/>					Aggregate (dry weight plus total moisture in pounds per each aggregate)
<input type="checkbox"/>					Scales balanced and counterbalances securely fastened
<input type="checkbox"/>					Scale weights for each material set and checked
<input type="checkbox"/>					Admixture measurement devices adjusted to measure correct amount
<input type="checkbox"/>					Water meter adjusted
<input type="checkbox"/>					Batching and Hauling
<input type="checkbox"/>					Batch trucks adequate for size of batch
<input type="checkbox"/>					No spillage or contamination while loading
<input type="checkbox"/>					Empty batch trucks clean and free of foreign material
<input type="checkbox"/>					Condition of agitating and non-agitating equipment for hauling Central Mix Concrete
<input type="checkbox"/>					Pre-wet mixer at beginning of operations
<input type="checkbox"/>					Set revolution counter to zero at beginning of operations
<input type="checkbox"/>					Routine Duties
<input type="checkbox"/>					Systematic check of scale settings during the day
<input type="checkbox"/>	Notes	Day	Week	Month	Item
<input type="checkbox"/>					Regular daily checks on cement received and used



B5 Pigeon River - Batch-plant Checklist

<input type="checkbox"/>					Constant testing and checking moisture content of aggregates
<input type="checkbox"/>					Daily report prepared and records kept up to date
<input type="checkbox"/>					Fill out haul tickets
<input type="checkbox"/>					Concrete batching plant daily maintenance is very important, so, we should do well to every part.
<input type="checkbox"/>					Assure the machine and the environment clean.
<input type="checkbox"/>					Clears the accumulation in the hopper timely to make the sensor properly back to zero.
<input type="checkbox"/>					Check the adequacy of the lubricating oil of lubrication points, oil mist collector in the pneumatic system should maintain sufficient quantity of oil.
<input type="checkbox"/>					Check motors, electrical appliances to have overheating, abnormal noises, and instrument indicating whether normal, signaling system is intact.
<input type="checkbox"/>					Regular inspection and adjustment to butterfly valve and cylinder, electric pneumatic valve, making opening and closing meet the demand.
<input type="checkbox"/>					Regular checks of systems, if find ash spills, gas leakage, oil spills and electric leakage, should deal with timely.
<input type="checkbox"/>					Concrete mixers and discharge hopper should be cleaned once every four hours, in order to avoid residual concrete consolidation, interfering with normal run.
<input type="checkbox"/>					Each class should be placed off the internal water of air compressor, gas storage tanks and filter, and get rid of the troubles during running.
<input type="checkbox"/>					Butterfly valves, electromagnetic valves, concrete mixers, air filters and oil mist collector in accordance with the relevant instructions maintenance.
<input type="checkbox"/>	Notes	Day	Week	Month	Item
<input type="checkbox"/>	Notes	Day	Week	Month	Item



B5 Pigeon River - Batch-plant Checklist

<input type="checkbox"/>					Before per shift must be unloaded check for belt conveyor, clean up debris, clay loam, and so on, fastening screws each part, adjusting the belt deviation phenomena, all rotating parts rotate flexible.
<input type="checkbox"/>					Electric drum should change the oil on a regular basis as the operating instruction.
<input type="checkbox"/>					Check and complement the grease of each moving parts bearing after using six months, later once a year to conduct a comprehensive demolition of oil.

Notes:

