1. DESCRIPTION OF THE PROPOSED ASPHALT PLANT

The proposed asphalt plant is an Astec Series BG2200 Modular Batch type mixing asphalt plant, with automatic controls, computer system, printer, and remote assistance capability.

The BG220 is a Hyper Modular Asphalt plant that requires a minimal amount of civil works and it is located on a small footprint. The plant has a low energy requirement which uses technology to reduce power consumption and power generator requirements. The plant sets up easily with a small capacity crane. All units are easy to assemble and mount.

2. PRODUCTION CAPACITY

The BG2200 has a mixer capacity that will produce up to 160 Tons of asphalt production per hour. The plant is capable of using up to 20% Recycled asphalt pavement to replace virgin aggregate which saves money and reuses the milled asphalt taken from the roads.

The fresh asphalt will be stored in an insulated, heated silo for up to 72 hours. This will allow the plant to fill the silo. Trucks will drive onto a weigh scale located under the silo, the silo hopper will open and a full load of asphalt will be placed into the truck bed at 150^{0}C. Each load of asphalt will be weighed and production tracked.

This plant also has the flexibility to change asphalt mix designs on the fly to service patching mixes or roads that may need a coarser or finer mix due to hills or other road geometry. These mixes will be loaded directly into the truck beds rather than being stored in the silo. This allows the main paving operation to continue without delays while special mixes are being mixed.

3. ASPHALT PLANT EQUIPMENT SPECIFICATIONS

3.1. Astec BG2200 Batching Tower

3.1.1. 20 cu. yd. (15 m^3) hopper
3.1.2. Hot elevator with 180 tph capacity,
3.1.3. Specially designed buckets
3.1.4. Heavy Duty Roller Chains for smooth operations
3.1.5. Screen bypass option
3.1.6. Powered by a geared motor.
3.1.7. Anti-roll back arrangement
3.1.8. Heavy duty roller type chain
3.1.9. Easy inspection and maintenance doors
3.1.10. Zero maintenance bearings in specially alloyed & cast; high wear resistant material
3.1.11. Vibrating screen fully enclosed 5.5 kW x 2 vibrators.
3.1.12. Allows separation of up to 5 aggregate sizes
3.1.13. Ripple flow type with vibrator
3.1.14. Zero maintenance fully enclosed components for vibrators
3.1.15. Overflow chutes
3.1.16. Enclosed and dust proof arrangement.
3.1.17. Screen mesh made in special heat and abrasion material.
3.1.18. Easily screen replacement design
3.1.19. Hot bins 50 T capacity
3.1.20. 5 partitions to store 5 sizes of aggregates.
3.1.21. Level indicators supplied on each individual bin.
3.1.22. Sample extraction port from each bin
3.1.23. By-pass bin wall supplied with Hardox Steel liners.

3.1.24. Trap liners provide long operations without maintenance.
3.1.25. Non-skid catwalks and protection
3.1.26. Stairs as per international safety norms
3.1.27. Thermocouple in the sand bin for temperature measurement
3.1.28. The hyper modular plant is supplied with steel base which enables set up of the plant without major civil and foundations works.
3.1.29. Steel base for cold feed bins, dryer drum, batching tower is supplied as standard.
3.1.30. Steel base needs to be tied down with bolts based on site conditions and seismic requirements.

3.2. Weighing and Feeding

3.2.1. Aggregate Bitumen and filler weighing system.
3.2.2. Aggregate with 4-point weighing
3.2.3. Bitumen weigh hopper with 4-point load cell
3.2.4. Feeding ramp with three-way automatic valve
3.2.5. Electrically heated and insulated bin
3.2.6. Spray pump for quick discharge into all the mixer
3.2.7. Bitumen transfer pump to transfer bitumen from bitumen tank to the bitumen weigh hopper
3.2.8. Thermocouple for bitumen temperature control

3.3. High Efficiency Twin Shaft Pug Mill Mixer

3.3.1. 2200 kg mixing size for best performance in normal operating conditions and best in mix and wear results.
3.3.2. Standard Mixing cycle - 45 seconds with normal mix designs. Cycle time can be changed based on mix requirements.
3.3.3. Shafts designed and built-in high-quality alloy steel
3.3.4. Mixer paddles made from wear resistant steel.
3.3.5. Easy to Replace design
3.3.6. Wear resisting design on arms with arm protection and wear resistant covers.
3.3.7. Wearing plate in high wear resistant special steel
3.3.8. Mixer gate on full width of mixer unit
3.3.9. Highly responsive pneumatically controlled mixer gate opening for quick emptying and for arresting segregation.
3.3.10. Easy maintenance doors for changing arms and tips.
3.3.11. Direct shaft mounted power gear without belts and chains to maintain
3.3.12. Power spray with bitumen pump assist.
3.3.13. Electrically heated spray pump with insulated pipelines.

3.4. High Efficiency Dryer Drum

3.4.1. 2 m diameter x 8.5 m long dryer
3.4.2. High Efficiency patented V Flights designs, ensures optimum material showering and maximum efficiency.
3.4.3. Insulated with 50 mm high grade glass wool and cladded with Stainless steel.
3.4.4. Drive 4 x 15 kW - direct shaft mounted gear boxes.
3.4.5. Production capacity: 160 tph @ 5 % moisture content.
3.4.6. Aggressively drying type flights
3.4.7. Heavy Duty drum tyres
3.4.8. Thrust wheels for arresting dryer movement.
3.4.9. Drum shell made from specially Alloy steel.
3.4.10. Combustion zone flights made in Stainless Steel

3.4.11. Dryer exit fights made in Hardox wear resistant steel.
3.4.12. Spring mounted dryer drum rings for smoother dryer drum rotations
3.4.13. Special dryer drum inlet seals to prevent loss of heat.
3.4.14. Heavy duty cross braced dryer for stability
3.4.15. Easy burner maintenance platform
3.4.16. Industrial thermocouple for dyer outlet temperature measurement
3.4.17. Heavy duty stabilised Dryer drum frame integrated and cross braced.
3.4.18. RAP ADDITION IN TO DRYER DRUM
3.4.19. RAP Collar on Dryer to add RAP into the dryer drum
3.4.20. Hardox flights and inlet chutes

3.5. Astec Whisper Jet WJ-50 Burner

3.5.1. Monobloc dryer drum burner
3.5.2. Low noise with silenced operation.
3.5.3. Operating with Auto and manual controls.
3.5.4. Burner controls - track dryer's pre-set temperature and adjusts the firing accordingly.
3.5.5. High efficiency combustion technology
3.5.6. Very low emission
3.5.7. Self-ignition system with electrical / pilot flame
3.5.8. All necessary pressure meters, pressure switch, indicators, safety devices and controls
3.5.9. Capacity: 50 MM BTU
3.5.10. Low noise 22kW integral fan,
3.5.11. Burner management system for safe operations and for safe start and stop.
3.5.12. Flame detection using UV sensors with interlocks on pump and valves.
3.5.13. Flame guard system to automatically shut down of fuel valves and for pre-purge operations.
3.5.14. Controls coupled with Aggregate set temperature and stack set temperature.
3.5.15. Burner blower and exhaust fan interlocks for pre-purge operations
3.5.16. Burner system status indication on the controller

3.6. Recycling Solution - Addition of RAP to the Dryer

3.6.1. Rated for up to 20% RAP.
3.6.2. 1x RAP feeder 10m^3, with aux. conveyor
3.6.3. Oversize removal screen on Rap feeder
3.6.4. Vibrators
3.6.5. 3.5 m loading width
3.6.6. RAP extractor with VFD 1.5 kW each
3.6.7. RAP Charging conveyor
3.6.8. RAP inlet chute made in Hardox
3.6.9. RAP Belt weighing system.

3.7. High Efficiency Dual Stage Pollution Control Baghouse Type

3.7.1. Two stage pollution control unit
3.7.2. Primary dust collector, integral to the unit, traps coarse sized dust
3.7.3. Specially designed bags in 18 Oz.
3.7.4. Filter Cages in Stainless Steel
3.7.5. Bag house top assembly in Stainless steel
3.7.6. Specially treated Meta-Aramid filtration media
3.7.7. Automatic bag cleaning and operating
3.7.8. Variable speed controls on exhaust fan motor
3.7.9. High efficiency Exhaust fan, 90 kW power, direct drive

3.7.10. Lower power consumption fan
3.7.11. Stack height: 20 m +/- above the grade level
3.7.12. Dust emission: Less than 20 mg/Nm^3
3.7.13. Overheating protection with temperature sensor

3.8. Horizontal Reclaimed Filler Hopper Under Baghouse Filter

3.8.1. 15 Ton reclaimed dust silo.
3.8.2. All Dust collected in the bag house is stored in the reclaimed filler silo.
3.8.3. Screw conveyor to feed coarse dust into hot elevator 5.5 kW, 30 m^3/hr.
3.8.4. One Dust transfer screw 7.5 kW 40 m^3/hr moves the collected dust out for rejection.
3.8.5. Dust reject screw, 4 kW transfers dust into a discharge point.
3.8.6. High Level indicator

3.9. Reclaimed Filler Silo

3.9.1. 20 ton reclaimed filler silo
3.9.2. Complete with elevator and transfer screws
3.9.3. Aerators at the bottom
3.9.4. Excess dust rejection screw to load excess dust in to a truck for disposal
3.9.5. Level indicator
3.9.6. Provision to feed weighed filler back in to the mixer

3.10. Six Cold Aggregate Feeding Bins

3.10.1. 10 m3 each, heaped capacity
3.10.2. Inverted Pyramid with ideal slopes
3.10.3. Units with individually controlled VFD
3.10.4. Bin vibrators on three feed bins linked with No flow switch.
3.10.5. Loading width 3.5 m
3.10.6. Hoppers made from quality steel equivalent to E350.
3.10.7. Easy-set-up extensions
3.10.8. Powered by high efficiency low power consuming geared motor arrangement.
3.10.9. Flow indicators and controls on each bin
3.10.10. Safety grids on upper part of bin for protection
3.10.11. Extractor belt
3.10.12. Extractor belts with corrugation 4+2 M24 belts 250/2 EP
3.10.13. 500 mm with tensioning device
3.10.14. VFD steeples controls for feeding conveyor
3.10.15. 1.5 kW geared motor.
3.10.16. High strength belt
3.10.17. Mineral flow control system Alarm
3.10.18. Each bin equipped with alarm no-flow indicators to indicate shortage of materials or an accidental interruption of minerals out flow in one or more hopper

3.11. Collecting Conveyor

3.11.1. Steel wire enforced collecting conveyor
3.11.2. 4 layers fabric rubber belt
3.11.3. Belt width : 650 mm
3.11.4. Collecting capacity 200 tph
3.11.5. Motor power 5.5 kw
3.11.6. High efficiency rollers and bearings

3.12. Charging Belt

3.12.1. Charging belt made from endless rubber conveyor
3.12.2. Heavy duty Rubber belt
3.12.3. Capacity 200 tph
3.12.4. Motor power : 5.5 kw
3.12.5. Belt width 500 mm
3.12.6. High quality rollers
3.12.7. Scarper arrangement
3.12.8. Belt weighing arrangement for use during producing RAP mixes.

3.13. Slinger Belt

3.13.1. Reversible Slinger belt made from endless rubber conveyor
3.13.2. Heavy duty Rubber belt
3.13.3. Capacity 200 tph
3.13.4. Motor power : 3 kw
3.13.5. Belt width 500 mm
3.13.6. High quality rollers
3.13.7. Scarper arrangement

3.14. Oversize Removal Screen

3.14.1. Oversize removal screen with fully enclosed vibrators
3.14.2. 2 Vibrators
3.14.3. 50 mm x 50 mm screen opening size
3.14.4. Diverter chute for rejection of over size
3.14.5. High efficiency springs

3.15. Control Cabin

3.15.1. Modern control cabin for plant operation
3.15.2. Astec Minds operating system
3.15.3. 2 large displays for plant operations
3.15.4. 11m x 2.2m x 2.5m main cabin unit
3.15.5. Dual compartment control cabin
3.15.6. One portion for operation and second for controls & electricals
3.15.7. Fully Air-conditioned with all round view
3.15.8. Centralized system, fully automatic with option to run on manual and semi-automatic modes.

3.16. 24" Drag Conveyor

3.16.1. The 24" wide x 43" deep x 74'-4 13/16" long self-supporting single chain drag conveyor is equipped with 60 HP motor with concentric reducer, 6” pitch roller chain, a nominal 7" deep x 3/4" thick x 22" long flights, Ni-Hard liners on the bottom and 8” high on sides, segmented head sprocket, hot oil heating channels on the bottom, 1” fiberglass insulation on bottom, hinged 11 gauge steel plate covers, and a clean-out door near the base.
3.16.2. The idler rolls are 16" diameter x 8" wide x 3/8" thick floating-type with double 1/4" thick diaphragms. Idler shafts are 2-7/16" in diameter and conveyor head shaft is 5- 9/16" in diameter AISI 4150 cold rolled steel.
3.16.3. The conveyor tail shaft is 4-7/16" diameter AISI 4150 cold rolled steel. A service platform near the drag head shaft includes a caged ladder from the top of a silo.

3.17. 100 Ton New Generation Storage Silo

3.17.1. The 12' diameter, 100 ton hot mix storage silo capacity is based on 120 pound/cubic foot material.

3.17.2. The silo has a heated and insulated 66 degree cone with 27" diameter discharge opening, temperature controller with adjustable set points, temperature indicator, non- heated spool section, 8" R30 insulation at cone, 6" R23 insulation at side walls, 12" R46 top insulation, high and low level indicators in silo, single clam discharge gate with oil seal, and guardrails around the top of silo.

3.17.3. The silo cone section is 3/8" A-36 steel plate, lower spool section is 3/8" A-36 plate, and upper spool section is 1/4" A-36 plate. A section of 1/2" thick ceramic lines the silo at the area where the cone and spool are joined. The cone insulation cover is 16 ga. painted steel and the side wall insulation cover is 20 ga. aluminium with baked-on enamel finish.

3.17.4. The silo legs are 14'-6" long providing a vertical truck clearance of 13'-6" above a 1'-0" thick deck on an above ground scale.

3.17.5. The lower one third of the cone and the discharge gate are electrically heated. The cone heat is provided by a 6-segment silicone blanket and the gates have blanket heat, 2300 watts total heat per gate.

3.17.6. A 3 ton enclosed silo loading batcher mounts on top of the silo and has 3" R10 insulation and two (2) level indicators. The top gate with grease seal is mounted on top of the silo loading batcher.

3.18. 11' x 30' Low Profile Truck Scale

3.18.1. The fully electronic low profile 30' x 11' truck scale has a checker floor and is shipped in 2 modules and includes six (6) load cells, (1) summing box, junction box, wiring in conduit, and quick connecting cables.

3.18.2. Each module is supported by wide flange main and support beams to provide exceptional rigidity and minimal deflection.

3.18.3. The large number of support members means less stress on the top plate and less chance of "dimpling" with repetitive loading. Accuracy meets The Bureau of Standards Handbook 44 criteria. All models are NTEP Certified Legal-for-Trade.

3.19. 1,200,000 Btu/hr Helical Coil Thermal Fluid Heater

3.19.1. Burner
3.19.2. Helical coil
3.19.3. Circulating pump and motor
3.19.4. Digital differential pressure switch
3.19.5. Piping, Wye ("Y") strainer and valves
3.19.6. Expansion tank
3.19.7. Controls
3.19.8. Electrical control panel
3.19.9. Steel shell and insulation
3.19.10. Exhaust stack
3.19.11. Skid
3.19.12. Factory testing
3.19.13. Power and control cables to power/control centre

3.20. Bitumen Storage Tank

3.20.1. 40,000 litre nominal capacity bitumen tank
3.20.2. Rectangular and shaped as a container.
3.20.3. 2.3 m wide and 2.5 m high
3.20.4. Easy for transportation
3.20.5. Supplied with hot oil heating coils.
3.20.6. Inspection hatch
3.20.7. Temperature indicator
3.20.8. DN 80 connection sizes

3.20.9. Manual valves and controls
3.20.10. Float type level indicator
3.20.11. Heavy duty insulation 150 mm
3.20.12. Connections for tank Loading, return and outlet connections.
3.20.13. Bitumen tank stirrers, 2 units per tank
3.20.14. Supplied with geared motor 5.5 kW.
3.20.15. Cabling and wired up to junction box.
3.20.16. Operated thru control panel of tank.
3.20.17. Interlocked with tank temperature.

3.21. Bitumen Loading Pump

3.21.1. Hot oil heated pump based on the selection of bitumen storage system.
3.21.2. With remote control connection
3.21.3. Internal gear pump with 3 phase motor on skid
3.21.4. Electrical junction box and cables

3.22. Bitumen Unloading Pump

3.22.1. Hot oil heated pump based on the selection of bitumen storage system.
3.22.2. With remote control connection
3.22.3. Internal gear pump with 3 phase motor on skid
3.22.4. Electrical junction box and cables

3.23. Bitumen Pipeline

3.23.1. DN 80 connection pipeline
3.23.2. Valves for one bitumen tank
3.23.3. Aluminium cladded
3.23.4. Insulated with high performance insulation
3.23.5. Tested and plumbed ready to launch at site

NEW REINFORCED CONCRETE SLAB W/ BUND WALLS FOR SECONDARY CONTAINMENT AREA FOR ASPHALT PLANT FUEL & BITUMEN TANKS. 40 FT X 50 FT,VOLUME 110% OF ONE TANK.

NEW ABOVE GROUND DOUBLE COMPARTMENT (SEALED) CESSPIT

NEW 40FT CONTAINER ADMIN STRUCTURE WITH SOLAR PANELS ON ROOF

RENOVATIONS AND EXTENSION TO EXISTING TIRE STORAGE SHED TO CONVERT INTO NEW WORKSHOP & LAB W/ NEW WATER TANK EXTENSION AND SOLAR PANELS ON ROOF

RED DASHED LINES INDICATE EXISTING ASPHALT PLANT TO BE DECOMMISSIONED AND REMOVED

NEW PAY LOADER RAMP FOR SCREENING PLANT HOPPER FEED. RETAINING WALL WITH WING WALLS AND GRAVEL FILLED.

WATERS OF CASTLE HARBOUR

EXISTING ROAD

NEW ACCESS ROAD

NEW RETAINING WALL

NEW RETAINING WALL

WORKSHOP

NEW ABOVE GROUND WATER TANK

PARTS STORAGE

RELOCATED PROPANE TANK W/ BOLLARDS

ASPHALT STORAGE SILO WEIGH SCALE

DUMP TRUCK WITH RELEASE AGENT SPRAYER

PROPOSED SHIP AGGREGATE STORAGE AREA

OFFICE

500 GALLON DIESEL TANK

500 GALLON BITUMEN TANK

PUG MILL

CONVEYOR

CONTROL BUILDING

BURNER

CONVEYOR

RECYCLED ASPHALT FEED BINS

RAMP

COLD FEED BINS

PROPOSED ASPHALT PLANT

SCREENS

CONVEYOR (TYP)

CONVEYOR (TYP)

RAMP

HOPPER

PROPOSED AGGREGATE SCREENING PLANT

PILES OF AGGREGATE SORTED BY SIZE (TYP)

SORTED AGGREGATE BUNKERS, REINFORCED SLABS ON GRADE & CAST IN PLACE REINFORCED WALLS.

1 C1.0 PROPOSED SITE PLAN
SCALE: 3/64" = 1'-0"

INFORMATION ONLY

LEGEND

conc concrete

Mean High Water

vegetation

chainlink fence

surface edge

spot level

0 10' 20' 30' 60' 90' 120'

MINISTRY OF PUBLIC WORKS

DEPARTMENT OF WORKS AND ENGINEERING

Government Administration Building,
3rd Floor | 56 Church Street | Hamilton, Bermuda HM12

Tel: (441) 501-3005

BRICK verde Architectural Services

P.O. Box HM 428, Hamilton, Bermuda HM BX
Tel: +1 441 707 0700
Email: info@brickverde.com
Web: www.brickverde.com

ASTEC

GENERAL NOTES

1. DO NOT SCALE THE DRAWINGS
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE OWNERS REPRESENTATIVE BEFORE PROCEEDING WITH THE WORKS.

ISSUE / REVISION

No.		Date:
P1	Issued for Review	04 Apr 2024
P2	Issued for Review	08 Apr 2024
P3	Issued for Review	09 Apr 2024
P4	Issued for Review	10 Apr 2024
P5	Issued for Review	15 Apr 2024
P6	Issued for Planning Coord	29 Apr 2024
P7	Issued for Review	10 May 2024
P8	Issued for Review	15 May 2024

SCALE: 3/64" = 1'-0"

SURVEY

Prepared By: GOVERNMENT LAND SURVEY DEPT
Date:

DRAWING

Prepared By: KGW
Date: 15/05/2024

Checked By: MM
Date: 15/05/2024

NORTH

Approved By: TC

Project Number: 32/23/200
Brick Verde Ref Number: 240219AP

Project Title:

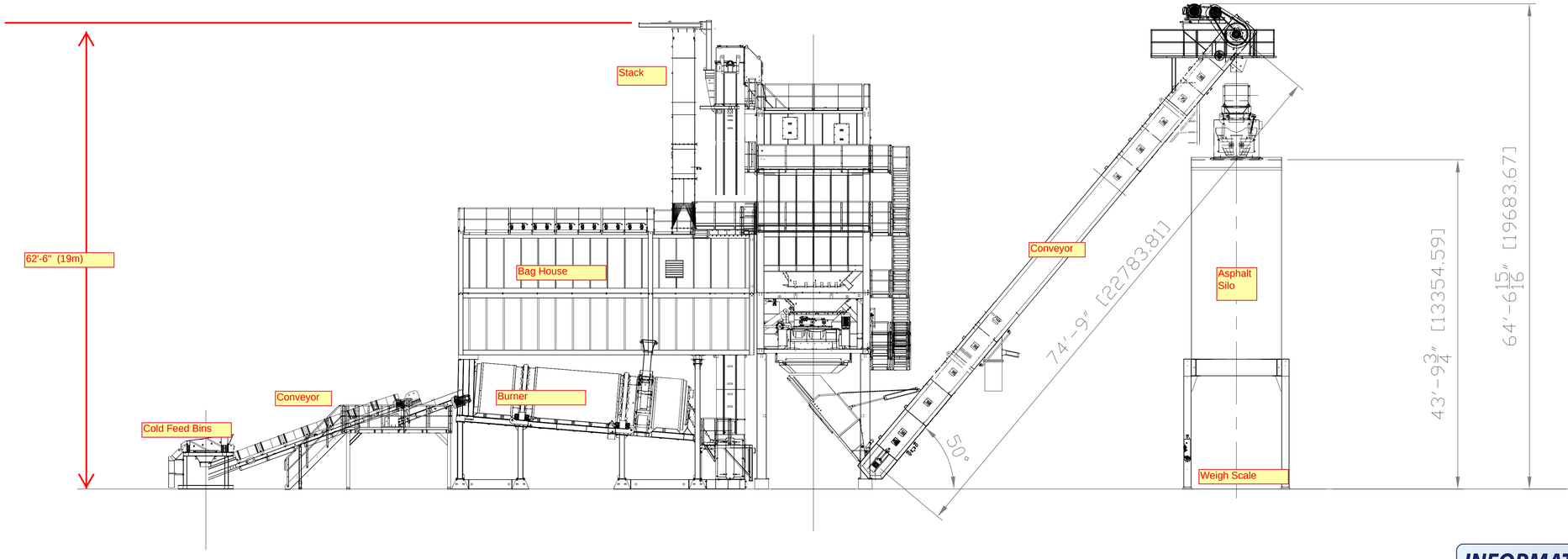
PROPOSED ASPHALT PLANT, AGGREGATE SCREENING PLANT, NEW WORKSHOP, LAB AND SITE SERVICES

PUBLIC WORKS QUARRY & DEPOT
QUARRY ROAD
HAMILTON PARISH
BERMUDA

Sheet Title: PROPOSED SITE PLAN

Revisions: P8

Sheet Number: **C1.0**



INFORMATION ONLY

1 / C1.3 PROPOSED ASPHALT PLANT ELEVATION
SCALE: 1/8" = 1'-0"

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Government Administration Building,
3rd Floor | 56 Church Street | Hamilton, Bermuda HM12

Tel: (441) 501-3005

BRICK Verde Architectural Services

P.O. Box HM 428, Hamilton, Bermuda HM BX
Tel: +1 441 707 0700
Email: info@brickverde.com
Web: www.brickverde.com

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SCALE: 1/8" = 1'-0"

SURVEY

Prepared By: GOVERNMENT LAND SURVEY DEPT — Date:

DRAWING

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PUBLIC WORKS QUARRY & DEPOT
QUARRY ROAD
HAMILTON PARISH
BERMUDA

Sheet Title:
PROPOSED ASPHALT PLANT ELEVATION

Revisions: P1

Sheet Number: **C1.3**