Concrete Slipform Construction
The FWS Group of Companies originated over sixty years ago with origins based in conventional general contracting. Since then our principals’ devotion to customer service and flexibility has made FWS a pioneer in new areas of expertise and creative contract design.

The FWS Group began using the slipform method in the early 1980s when our operations were expanded into agricultural construction. Today the FWS Group is Canada’s foremost leader in this specialized sector, having constructed in excess of 150 concrete structures utilizing the slipform method. Most of the slipform concrete structures FWS has constructed have been large inland grain terminals. Other slipform concrete structures include mine shaft head frames, multi-level flour mills, malt germination towers, anaerobic digester tanks, and water tower and cement distribution terminals.

During the past 30 years, the FWS Group has continuously expanded its slipforming knowledge base and expertise in terms of design and engineering of these structures, as well as the on-site construction process. With its vast amount of experience, FWS can deliver slipformed projects using efficient and economical designs along with trained and safety conscious construction crews.

Slipform Construction techniques, as this name suggests, is a vertical sliding-form construction method of pouring concrete structures. It begins with the construction of a four foot high form placed on top of a foundation, with a support and bracing system to ensure that the form maintains its shape during concrete pouring operation.

Inside and outside forms create the cavity of the wall, and inside this cavity, reinforcing steel is tied together vertically and horizontally to reinforce the concrete wall. The form is then connected to jack rods with hydraulic jacks, which automatically move the form vertically in minute increments as the concrete is being poured. The rate of “jacking” is in direct relation to the rate at which the concrete cures sufficiently to advance the forms. Typically the forms are raised 20 to 24 feet per 24 hours.

Once pouring begins, it continues around the clock until the top of the structure is reached, allowing for a monolithic poured concrete structure.
PRECISION, PROFESSIONALISM, EFFICIENCY & QUALITY.
FWS employs a diverse group of accomplished professionals. We recognize these resources are necessary to meet the varied needs of both the FWS Group and its clients. The FWS team is structured to address the goals and values that are critical to the success of all stakeholders. It includes highly skilled Engineers, Managers, Estimators, Project Managers, Superintendents, Trades People and Support Staff.

We pride ourselves on being “an employer of choice” within the construction industry and in the communities where we operate. Offering employees the opportunity to grow and thrive in the pursuit of their careers, FWS is truly a “team” of individuals that bring varied and diverse expertise to bear on issues confronting clients and FWS companies alike.

Our management style is reflected in our “Management Team approach” to decision making. While individual Leaders/Managers are required to use personal initiative in performances of responsibility, FWS supports strong communication and prefers a consensus approach to significant decisions. The FWS Management Team includes the individuals shown in the brief “bios” that can be viewed on our website (FWSgroup.com), as well as key executives from the various FWS companies.
PROJECTS

RICHARDSON NUTRITION HOLDINGS LTD.
Yorkton, Saskatchewan

CANOLA CRUSHING FACILITY

- 2,400 METRIC TONNE PER DAY CAPACITY OF CANOLA CRUSH PER DAY
- 1,000 METRIC TONNES OF FULLY REFINED FOOD GRADE OIL PER DAY
- SLIPFORM CONCRETE MEAL STORAGE
- THREE STRUCTURAL STEEL BUILDINGS
- SEED PREPARATION BUILDING
- EXTRACTION BUILDING
- REFINERY BUILDING
- PRE-ENG UTILITY BUILDING
- ADMINISTRATION OFFICE
- WASTE WATER LAGOON

CARGILL LIMITED
Clavet, Saskatchewan

INLAND GRAIN TERMINAL

- 41,905 METRIC TON CONCRETE STORAGE, IN WHICH,
  - 21,022 METRIC TON CONCRETE STORAGE BUILT IN YEAR 2000
  - 20,883 METRIC TON CONCRETE STORAGE BUILT IN YEAR 2005
- DOUBLE DRIVEWAYS C/W 10’ X 100’ 100 TONNE PLATFORM SCALING SYSTEM
- 15,000 BPH RAIL/TRUCK RECEIVING CAPACITY
- 30,000 BPH RAIL SHIPPING CAPACITY ON 4 TRACKS
- 2,000 BPH DRYING CAPACITY
- CLEANING SYSTEM SIZED AT 120 MTPH ON #1 RED SPRING WHEAT
- 3,060 SQUARE FT. OFFICE

VITERRA CANADA
Sexsmith, Alberta

INLAND GRAIN TERMINAL

- 30,000 METRIC TONNE COMBINED STORAGE
- 13,600 METRIC TONNE CONCRETE STORAGE
- 16,400 METRIC TONNE STORAGE IN 4 STEEL BIN
- 680 METRIC TONNE/HR RECEIVING CAPACITY
- 1,360 METRIC TONNE/HR SIPPING CAPACITY
- 100 METRIC TONNE/HR DRYING CAPACITY
- 2 STORY 5,000 SQUARE FT. OFFICE
PROJECTS

POTASH CORP SASKATCHEWAN
Scissors Creek, Saskatchewan
SHAFT HEAD FRAME
• SLIPFORM CONCRETE TOWER
• 60’ X 46’ X 192 FEET HIGH
• MULTIPLE WORK FLOORS
• ACCESS AND FRESH AIR TUNNEL SYSTEMS
• SERVICE STRUCTURES

CARGILL LIMITED
North Battleford, Saskatchewan
INLAND GRAIN TERMINAL
• 21,000 TONNE WHEAT SLIPFORM STORAGE ANNEX
• 8 BARREL ANNEXX
• PILED FOUNDATION
• FULL LINE 100 MTPH CLEANER SYSTEM
• NEW DISTRIBUTION AND RECLAIM MACHINERY
• ATTACHED SLIPFORM CONCRETE CLEANER HOUSE C/W INTERNAL FLOORS

LETHBRIDGE INLAND TERMINAL
Lethbridge, Alberta
INLAND GRAIN TERMINAL
• 41,000 TONNE WHEAT STORAGE PLANT
• 14,000 TONNE CAPACITY SLIPFORM CONCRETE WORKHOUSE
• 27,000 TONNE CAPACITY STEEL STORAGE
• RECEIVING SHED c/w 100’ PLATFORM SCALE
• DUAL 410 TPH RECEIVING SYSTEM
• DEDICATED 700 TPH SHIPPING SYSTEM
• FULL LINE 100 MTPH CLEANING SYSTEM
• FULLY AUTOMATED CONTROL SYSTEM
PROJECTS

NORTH WEST TERMINAL LTD.
Unity, Saskatchewan
INLAND GRAIN TERMINAL
- 40,000 TONNES SLIPFORM CONCRETE STORAGE STRUCTURES WITH 42 DIVISIONS
- DUAL RECEIVING DRIVESHEDS C/W 100’ PLATFORM SCALE IN DRIVEWAY #1
- 2,500 ft² SINGLE STOREY OFFICE
- 3 MAIN BUCKET ELEVATORS, 1 CLEAN GRAIN LEG
- 800 TPH TRACK LOADOUT OVER 2 TRACKS
- 80 TPH CEREAL GRAIN CLEANING SYSTEM

HUSKY ENERGY INC.
Minnedosa, Manitoba
FEEDSTOCK & CO-PRODUCT STORAGE FOR ETHANOL FACILITY
- 8,930 TONNE WHEAT SLIPFORM STORAGE STRUCTURE
- 4 BARREL HOUSE (4 @ 32’ DIAMETER, 130’-6” SLIP)
- RAFT FOUNDATION
- 2,706 TONNES DDGS FLAT STORAGE BUILDING
- 600 TONNES / DAY DDGS TRUCK & RAIL SHIPPING

RICHARDSON INTERNATIONAL LTD.
Brandon, Manitoba
INLAND GRAIN TERMINAL
- 13,000 TONNES SLIPFORM CONCRETE STORAGE STRUCTURE WITH 35 BINS
- DUAL RECEIVING DRIVESHEDS WITH PLATFORM SCALE
- 2,000 ft² OF DEVELOPED OFFICE SPACE
- TRIPLE 15,000 BPH BUCKET ELEVATORS
- 800 TPH SHIPPING SYSTEM OVER 2 TRACKS
- 70 TPH CEREAL CLEANING SYSTEM
WEYBURN INLAND TERMINAL LTD.
Weyburn, Saskatchewan

STORAGE ADDITIONS TO EXISTING TERMINAL

FWS has constructed storage additions to this facility as follows:
• Phase 1 - 1992 (4 tanks – 14,500 tonne)
• Phase 2 - 1994 (4 tanks – 18,000 tonne)
• Phase 3 - 1998 (12 tanks – 22,000 tonne)
• Phase 4 – 2001-02 (8 tanks – 30,000 tonne)

VITERRA INC.
Lacombe, Alberta

INLAND GRAIN TERMINAL

• 17,600 tonne storage structure
• 6 barrel house (4 @ 32’, and 2 @ 36’-5”, 130’-6” slip)
• Pile / raft foundation, no split cleaner floors
• 27 bins (24 house, 2 preweigh, 1 dryer)
• 1750 SF. office complete with full basement

SOUTH WEST TERMINAL LTD.
Gull Lake, Saskatchewan

INLAND GRAIN TERMINAL

• 50,000 tonne combined storage facility
• 17,500 tonne slipform concrete workhouse with 35 bins
• 37,000 tonne flat bottom steel tanks
• Dual drivesheds C/W 100’ platform scale in driveway #1
• 2,000 FT² single storey office
• 3 main bucket elevators
• 800 TPH shipping system over 2 rails
• 120 TPH cereal grain cleaning system
PROJECTS

RICHARDSON INTERNATIONAL LTD.
Southey, Saskatchewan
INLAND GRAIN TERMINAL
- 18,000 TONNE STORAGE STRUCTURE
- 6 BARREL HOUSE @ 32’, 130’-6” SLIP
- PILED FOUNDATION, SPLIT CLEANER FLOORS
- 40 BINS (25 HOUSE, 7 LOWER CLEAN GRAIN BINS, 6 UPPER DIRTY GRAIN BINS, 2 PREWEIGHT SHIPPING BINS)

JAMES VALLEY GRAIN, LLC
Oakes, North Dakota, USA
INLAND CORN & SOYBEAN TERMINAL
- 30,000 TONNE STORAGE STRUCTURE WITH 17 DIVISIONS
- 8 – 38 FT. DIA. STORAGE TANKS & 9 STICE BINS
- FLOATING FOUNDATION SLAB
- ADDITIONAL 2,000,000 BUSHEL EXTERIOR STORAGE CAPACITY
- 2 RECEIVING PITS WITH RECEIVING CAPACITY OF 20,000 BPA
- 1,600 TPH SHIPPING SYSTEM
- 140 TPH ZIMMERMAN DRYER SYSTEM
- CAPACITY TO LOAD 110 RAIL CARS IN 12 HOURS
- LUFT KANAL CLEAN OUT SYSTEM CAPABLE OF 100% CLEAN OUT CAPACITY

CARGILL LIMITED
Morris, Manitoba
INLAND GRAIN TERMINAL
- 11,800 TONNE STORAGE STRUCTURE WITH 36 DIVISIONS
- RECEIVING DRIVESHED COMPLETE WITH PLATFORM SCALE
- 1260 FT² DEVELOPED OFFICE / CONTROL ROOM AREA
- 4 MAIN BUCKET ELEVATORS
- 800 TPH SHIPPING OVER 3 TRACK LOADOUT FOR 56 CAR UNIT TRAIN LOADING
- 80 MTPH CEREAL GRAIN CLEANING SYSTEM
VITERRA INC.  
Indus, Alberta  
**INLAND GRAIN TERMINAL**  
- 38,000 TONNE STORAGE STRUCTURE WITH 54 DIVISIONS  
- DUAL RECEIVING DRIVESHEDS C/W PLATFORM SCALES  
- 5,000 ft² DEVELOPED OFFICE AREA  
- 4 MAIN BUCKET ELEVATORS  
- 800 TPH SHIPPING OVER 4 TRACK LOADOUT FOR 104 CAR UNIT TRAIN LOADING  
- 125 TPH CEREAL GRAIN CLEANING SYSTEM  
- 55 TPH DRYER SYSTEM  

CARGILL LIMITED  
Moose Jaw, Saskatchewan  
**INLAND GRAIN TERMINAL**  
- 17,500 TONNE SLIPFORM CONCRETE STORAGE STRUCTURE WITH 42 DIVISIONS  
- DUAL RECEIVING DRIVESHEDS C/W 100’ PLATFORM SCALE IN DRIVEWAY #1  
- 2,500 ft² SINGLE STOREY OFFICE  
- 3 MAIN BUCKET ELEVATORS, 1 CLEAN GRAIN LEG  
- 800 TPH TRACK LOADOUT OVER 2 TRACKS  
- 800 TPH CEREAL GRAIN CLEANING SYSTEM  

VITERRA INC.  
Rycroft, Alberta  
**INLAND GRAIN TERMINAL**  
- 30,000 TONNES SLIPFORM CONCRETE STORAGE STRUCTURE WITH 46 BINS  
- DUAL RECEIVING DRIVESHEDS WITH 120’ PLATFORM SCALES  
- 4,000 ft² OF DEVELOPED OFFICE SPACE  
- 3 MAIN BUCKET ELEVATORS  
- 800 BPH SHIPPING SYSTEM OVER 2 TRACKS  
- 125 BPH BARLEY CLEANING SYSTEM  
- 55 BPH GRAIN DRYER SYSTEM
PROJECTS

GROWING POWER HAIRY HILL LP
Vegreville, Alberta
GPHH GPADS DIGESTOR CONSTRUCTION
• SLIPFORM TWO 7 MILLION LITRE DIGESTATE HOLDING TANKS
• METHANE INTEGRATION SYSTEMS
• BIOWASTE INPUT PROCESSING SYSTEMS

ROGERS FOODS LTD.
Chilliwack, British Columbia
FLOUR MILL
• 250 TONNES PER DAY CAPACITY
• 4,500 TONNE SLIPFORMED BULK STORAGE
• CARLOAD RECEIVING CAPABILITY
• 900 SQ. METRE, 4 STOREY MAIN MILL BUILDING
• 1300 SQ. METRE WAREHOUS OFFICE

CARGILL LIMITED
McLennan, Alberta
GRAIN STORAGE TERMINAL
• 8,700 TONNE CONCRETE STORAGE STRUCTURE
• 18,755 TONNE OF STORAGE IN 3 STEEL TANKS
• HIGH THROUGHPUT, SINGLE DRIVEWAY RECEIVING WITH 120 FT TRUCK SCALE AND REMOTE TRUCK SAMPLE PROBE
• 3600 SQFT OFFICE COMBINED WITH 2000 SQFT CONTROL/GRADING/ELECTRICAL BUILDING
• 4 MAIN BUCKET ELEVATORS
• 60,000 BPH SHIPPING SYSTEM, OVER RAIL BULKWEIGHER TO SINGLE LOADING TRACK,
• EXPORT READY CLEANING SYSTEM WHEAT (120 MTPH) AND CANOLA (90 MTPH)
• 55 MTPH GRAIN DRIER
LAFAARGE
Fargo, North Dakota
CEMENT DISTRIBUTION TERMINAL
• 9700 TON SLIPFORM CONCRETE STORAGE STRUCTURE WITH 4 DIVISIONS.
• 200 MTPH RAIL RECEIVING SYSTEM.
• 350 MTPH TRUCK UNLOAD SYSTEM.
• SILO AERATION SYSTEM.
• PLC AUTOMATED CONTROL SYSTEM.
• COMPLETE CIVIL, MECHANICAL AND ELECTRICAL INSTALLATIONS

COMOX VALLEY REGIONAL DISTRICT
Courtenay, British Columbia
COMOX WATER STORAGE
• 20 M DIAMETER WATER TANK
• 26 M HIGH
• CAPACITY 1.5 MILLION GALLONS OF WATER
• WATER WEIGHT: 15 MILLION POUNDS

LAFAARGE
Winnipeg, Manitoba
CEMENT DISTRIBUTION TERMINAL
• 10,000 TONNE SLIPFORM CONCRETE STORAGE STRUCTURE WITH 11 DIVISIONS
• MIXING AND BLENDING FACILITY
• COMPLETE CIVIL, MECHANICAL, AND ELECTRICAL INSTALLATIONS
• TRUCK LOADOUT SYSTEM TO BULK TANKERS c/w 140’ PLATFORM SCALE
• BLENDING SYSTEM c/w TANKS, SCALES, AIR SLIDES, AND VALVES
• SILO AERATION SYSTEM
• FULLY AUTOMATED CONTROL SYSTEM
ONTARIO POWER GENERATION
Atikokan, Ontario
OPG WOOD PELLET STORAGE
• TWO 5000 MT OF WOOD PELLET STORAGE, 65’ IN DIAMETER X 144’ HIGH
• WOOD PELLET STORAGE IS UNIQUE IN REGARDS TO NFPA GUIDELINES ON EXPLOSIVITY
  • REQUIRED 78 EXPLOSION PANELS ON THE TOP OF THE SILO FOR PRESSURE RELIEF IN THE EVENT OF AN EXPLOSION
  • WALL THICKNESS OF 20”
• SILO DISCHARGE CONSISTED OF FOUR EXPANDED FLOW DISCHARGE HOPPERS PER SILO
  • DISCHARGE HOPPERS COMPRISED OF CONCRETE AND STEEL
• 22,000 CFM AERATION SYSTEM FOR WOOD PELLET COOLING IF REQUIRED

RIO TINTO ALCAN
Kitimat, British Columbia
SLIPFORM CONCRETE SILOS
• 20,000 TONNE FRESH ALUMINA STORAGE SILO
• 10,000 TONNE CALCINED COKE STORAGE SILO
• STRUCTURAL STEEL SILO ROOFS
• CONCRETE RECLAIM TUNNELS & SLOPED CONCRETE BINFILL
• STRUCTURAL FOUNDATIONS FOR EQUIPMENT AND BUILDINGS

GOLDCORP RED LAKE GOLD MINES
Red Lake, Ontario
SLIPFORM HEADFRAME
• SLIPFORM HEADFRAME FOR GOLDMINE SHAFT
• APPROX 30 FT X 40 FT X 208 FT, HIGH
• ALL WORKS COMPLETED AT BELOW ZERO CELSIUS
• FWS DESIGNED AN INNOVATIVE GLYCOL HEATING SYSTEM FOR THE SLIP FORMED CONCRETE AS THE POUR WAS UNDERTAKEN IN DECEMBER
PRECISION,
PROFESSIONALISM,
EFFICIENCY & QUALITY.

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