SAFE JOB PROCEDURE **SJP-02**

April 18, 2018 **LOWERING IN PIPELINE**

PURPOSE/APPLICATION

Lowering in is the activity of lowering pipe, that has been strung out along the right-of-way and welded together, in to the open trench. The pipe sections are lowered into the ditch by tractors using lowering-in belts or cradles in a carefully coordinated action. Pipe will be lowered from cones or skids on the ground prior to being lowered in to the excavation. Typically, tractors with special arms called side booms are used to lower the pipe into the trench. Care is taken to avoid damaging the pipe and its exterior coating.

PPE

- High visibility vest or coveralls
- All site-specific PPE

TRAINING

- Orientation
- Tailgate meeting & completed HIAC THA
- Competent & experienced signal/spotter
- Competent & experienced equipment operator

TOOLS/EQUIPMENT

- Rigging and rigging components
- Pipe belt or cradle
- Side boom or booms
- Jeep repair material/equipment
- Pipeline skids and/or pipe cones
- Air horn (If required for communication)
- Post hole spoon shovel (goon spoon, long shovel, crumb shovel)

#	Job Steps	Hazards	Control Measures
1	Bump pipe down off of cones onto skids beside ditch (Only if reasonable and practicable)	Suspended loads, crush points (between ground and pipe, skids/cones and pipe, between boom stick and equipment, etc.), slips/trips/falls (into ditch, clumps of dirt, changing ground conditions), moving equipment, inexperienced workers, propane bottles	▪ Identify line of fire & stay clear ▪ Allow machines to do the work, don't force it manually ▪ Stay clear of ditch side ▪ Wear proper footwear ▪ High visibility clothing ▪ Mentor new and inexperienced workers ▪ Operator ensures that side boom and its hoisting components have been thoroughly inspected prior to proceeding with task. ▪ Keep ROW clear of objects (trucks, propane bottles, etc.) ▪ Machines only to move when directed to
2	Build slider, crotch or skid pile in bell hole to receive pipe end as pipe is lowered in. Once complete, everyone exits bell hole to eliminate line of fire hazard of pipe.	Improperly built bell hole, Muddy/Icy/slippery conditions, poorly built stairs, Splinters, Sloughing/Cracking, Water puddles,	▪ Ensure proper slope on ditch ▪ Ensure adequate stairs to enter and exit ▪ Proper lifting and ergonomics (lift with your legs not your back) ▪ Proper gloves and footwear ▪ Pre-inspect skids ▪ Clear communication with other workers ▪ Do not throw skids to workers, pass them

#	Job Steps	Hazards	Control Measures
2a *	Position side boom over top of pipe. *(Generally for Small cradles)	Line of fire, crushing injuries, equipment damage, conflicting work	▪ Competent operator ▪ Operator ensures that side boom and its hoisting components have been thoroughly inspected prior to proceeding with task. ▪ Operator must not move boom in any way unless signaled to do so. (Single signal person) ▪ Equipment spotter/signaler directing side boom movements when safe to do so ▪ Ensure any equipment, tools, etc. are out of the line of fire of boom tracks ▪ Stay out from between boom and any other equipment ▪ Never go under suspended loads ▪ Communicate intention to move to any other workers in area prior to moving boom ▪ Conduct walkaround of equipment prior to moving
3 *	Place cradles under pipe and attach cradles to side boom. *(Generally for Small cradles)	Slip/trips/falls, back/muscle strains, pinch points, equipment failure	▪ Watch your footing, always walk on site never run excepting in an emergency situation ▪ Warm up and stretch muscles before attempting any physical activity ▪ Use proper body mechanics when lifting heavy objects. ▪ Get help for any object over 50 lbs or use mechanical means ▪ Always wear gloves, keep any body parts out of harm's way in regard to possible pinch points ▪ Inspect all attachment components, cradle and rigging prior to attaching to side boom ▪ Always double check all connection components and rigging prior to hoisting pipe
3a *	Hook cradles up to side boom *(Generally for large cradles)	Slip/trips/falls, back/muscle strains, pinch points, equipment failure	▪ Watch your footing, always walk on site, never run except in an emergency situation ▪ Warm up and stretch muscles before attempting any physical activity

#	Job Steps	Hazards	Control Measures
			▪ Use proper body mechanics when lifting heavy objects ▪ Get help for any object over 50 lbs or use mechanical means ▪ Always wear gloves, keep any body parts out of harm's way in regard to possible pinch points ▪ Inspect all attachment components, cradle and rigging prior to attaching to side boom ▪ Always double check all connection components and rigging prior to hoisting pipe
3b *	Center cradles to pipe and walk side boom forward and slowly roll cradles onto and under pipe. *(Generally for large cradles)	Line of fire, crushing injuries, equipment damage, conflicting work, twisted and bound cradle	▪ Competent operator ▪ Operator ensures that side boom and its hoisting components have been thoroughly inspected prior to proceeding with task ▪ Operator must not move boom in any way unless signaled to do so (Single signal person) ▪ Equipment spotter/signaler directing side boom movements when safe to do so ▪ Ensure any equipment, tools, etc. are out of the line of fire of boom tracks ▪ Stay out from between boom and any other equipment ▪ Never go under suspended loads ▪ Communicate intention to move to any other workers in area prior to moving boom
4	Lift cradles to support weight of pipe, ensure good control over load.	Equipment failure, crushing, contact injury, pinch points, miss communication, damage to pipe coating	▪ Eyes and mind on the task at hand ▪ Stay out of the line of fire ▪ Use appropriate concise signal ▪ Operator and signaler must maintain eye contact/communication at all times ▪ Do not work between pipe and ditch or pipe and boom ▪ Ensure cradles move freely ▪ Ensure safety latches/pins are in place & shackles are tight

#	Job Steps	Hazards	Control Measures
5	Attach the jeep machine behind cradles and follow jeeping procedure.	Slip/trips/falls (Dirt/ice clumps, uneven ground, ditch edge), back/muscle strains, pinch points (Between pipe and equipment, jeeper springs), equipment failure (Cones/skids), electric shock, heavy equipment (Boom tracks & boom)	▪ Watch your footing, always walk on site never run excepting in an emergency situation ▪ Warm up and stretch muscles before attempting any physical activity ▪ Use proper body mechanics when lifting heavy objects ▪ Get help for any object over 50 lbs or use mechanical means ▪ Always wear gloves, keep any body parts out of harm's way in regard to possible pinch points ▪ Wear appropriate gloves ▪ Ensure jeep machine is in off position when attaching ▪ High visibility clothing
6	Boom out over center of ditch and proceed moving forward.	Line of fire, crushing injuries, equipment damage and failure, conflicting work	▪ Competent operator ▪ Operator ensures that side boom and its hoisting components have been thoroughly inspected prior to proceeding with task ▪ Operator must not move boom in any way unless signaled to do so ▪ Equipment spotter/signaler directing side boom movements when safe to do so ▪ Ensure any equipment, tools, etc. are out of the line of fire of boom tracks ▪ Stay out from between boom and any other equipment ▪ Never go under suspended loads ▪ Communicate intention to move to any other workers in area prior to moving boom ▪ Eyes and mind on the task at hand ▪ Do not work between pipe and ditch or pipe and boom ▪ Ensure path of travel is clear

#	Job Steps	Hazards	Control Measures
7	Lower loose section of pipe onto skid pile, slider or crotch *Note-No cones will be used for securing loose end of pipe	Crush points, suspended pipe, moving/swinging pipe, Pipe jeeps, Risk tolerance, State of mind, inexperienced and impatient operators, lack of communication	▪ Competent operator ▪ Operator ensures that side boom and its hoisting components have been thoroughly inspected prior to proceeding with task ▪ Operator must not move boom in any way unless signaled to do so ▪ Equipment spotter/signaler directing side boom movements when safe to do so ▪ Ensure any equipment, tools, etc. are out of the line of fire of boom tracks ▪ Stay out from between boom and any other equipment ▪ Never go under suspended loads ▪ Ensure to communicate movement intent to any other conflicting work in area prior to moving boom ▪ Eyes & mind on the task at hand
8	When signaled to stop for coating repair or crumbling ditch – stop. Use crumb shovel to pull rocks from ditch. Boom in if repair is required and wait for repair to be completed.	Slip/trips/falls, back/muscle strains, pinch points, equipment failure, chemical, fire, suspended loads, working near ditch, Repair compound chemical, Propane torch	▪ Same as step #5 above ▪ WHMIS ▪ Fire extinguishers ▪ Appropriate PPE for jeep repair compound ▪ Stay on work side of ditch ▪ Turn Jeep machine off ▪ Ensure Solid stable work area to conduct repair
9	Once repair is complete boom back to center of ditch and continue to lower in pipe.	Line of fire, crushing injuries, equipment damage, conflicting work	▪ Competent operator ▪ Operator ensures that side boom and its hoisting components have been thoroughly inspected prior to proceeding with task ▪ Operator must not move boom in any way unless signaled to do so ▪ Equipment spotter/signaler directing side boom movements when safe to do so ▪ Ensure any equipment, tools, etc. are out of the line of fire of boom tracks ▪ Stay out from between boom and any other equipment ▪ Never go under suspended loads ▪ Communicate intention to move to any other workers in

#	Job Steps	Hazards	Control Measures
			area prior to moving boom ▪ Eyes and mind on the task at hand ▪ Stay out of ditch until pipe is lowered ▪ Do not work between pipe and ditch or pipe and boom
10	Build a skid pile, slider, or crotch in ditch then set pipe end down if lowering end into ditch. Otherwise leave enough pipe above ground to ensure stable.	Slip/trips/falls, back/muscle strains, pinch points, equipment failure, pipe swing or recoil	▪ Watch your footing, always walk on site, never run except in an emergency situation ▪ Warm up and stretch muscles before attempting any physical activity ▪ Use proper body mechanics when lifting heavy objects ▪ Always wear gloves, keep any body parts out of harm's way in regard to possible pinch points ▪ Inspect all attachment components, cradle and rigging prior to attaching to side boom. ▪ Always double check all connection components and rigging prior to hoisting pipe ▪ Ensure that string ends are secure from slippage or any other kind of movement ▪ Stay out of ditch until pipe is lowered
11	Booming in to secure loose ends of pipe string once lowering in has been completed.	Equip. failure/damage, line of fire, crushing injuries, conflicting work, miss communication	▪ Same as step #5 above ▪ Inspection ▪ Eyes and mind on the task at hand ▪ Stay clear of pipe end
12	Unhook cradles.	Same as step #2 above	▪ Same as step #3 A or B above

Additional Precautions:

- Do not position yourself between the pipe and the ditch or under any suspended loads.
- Stay clear of swinging or moving pipe.
- Maintain visual contact with the boom/equipment operator.
- Many incidents and injuries have occurred while lowering pipe into a ditch, either on the start or finish of the string. Extra precautions must be taken if a worker needs to go into a bell hole while lowering the pipe into the ditch. It is recommended that no worker be exposed to the line of fire if possible.

REFERENCE/REGULATIONS

- Alberta OH&S Code
  - Part 2 Hazard Assessment, Elimination and Code
  - Part 6 Cranes, Hoists and Lifting Devices
  - Part 7 Emergency Preparedness and Response
  - Part 18 Personal Protective Equipment
  - Part 19 Powered Mobile Equipment
  - Part 32 Excavating and Tunneling
- British Columbia OH&S Regulation
  - Part 8 Personal Protective Clothing and Equipment
  - Part 14 Cranes and Hoists
  - Part 16 Mobile Equipment
  - Part 20 Construction, Excavation and Demolition
- Saskatchewan OH&S Act and Regulation
  - Part 7 Personal Protective Equipment
  - Part 13 Hoists, Cranes and Lifting Devices
  - Part 14 Rigging
- SJP-03 Jeeping/Holiday Detection
- All Applicable CPES Codes, Rules, Policies and Procedures

Appendix:

Pipe Cone Ratings by Vendor

Vendor	Pipe Size	Weight	Rating	ROT
Marmit Plastics	2-8″	9 lbs.	2300kgs	Just over 1 full joint of 8″ 1.00 wall per cone
Proline Global	2-8″	11 lbs.	898kgs	Just over 1 full joint of 8″ .344 wall per cone
	8-12″	18 lbs.	1576kgs	Just over 1 full joint of 12″ .438 wall per cone
	12-24″	42 lbs.	4540kgs	Review as required
Paddle Plastics	4-12″	13 lbs.	3650kgs	Just over 1 full joint of 12″ 1.062 wall per cone
	12-16″	25 lbs.	5500kgs	Just over 1 full joint of 16″ 1.250 wall per cone
CRC Evans	Purchased by size. Weights and Ratings Depend on the supplier they purchase from.			

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