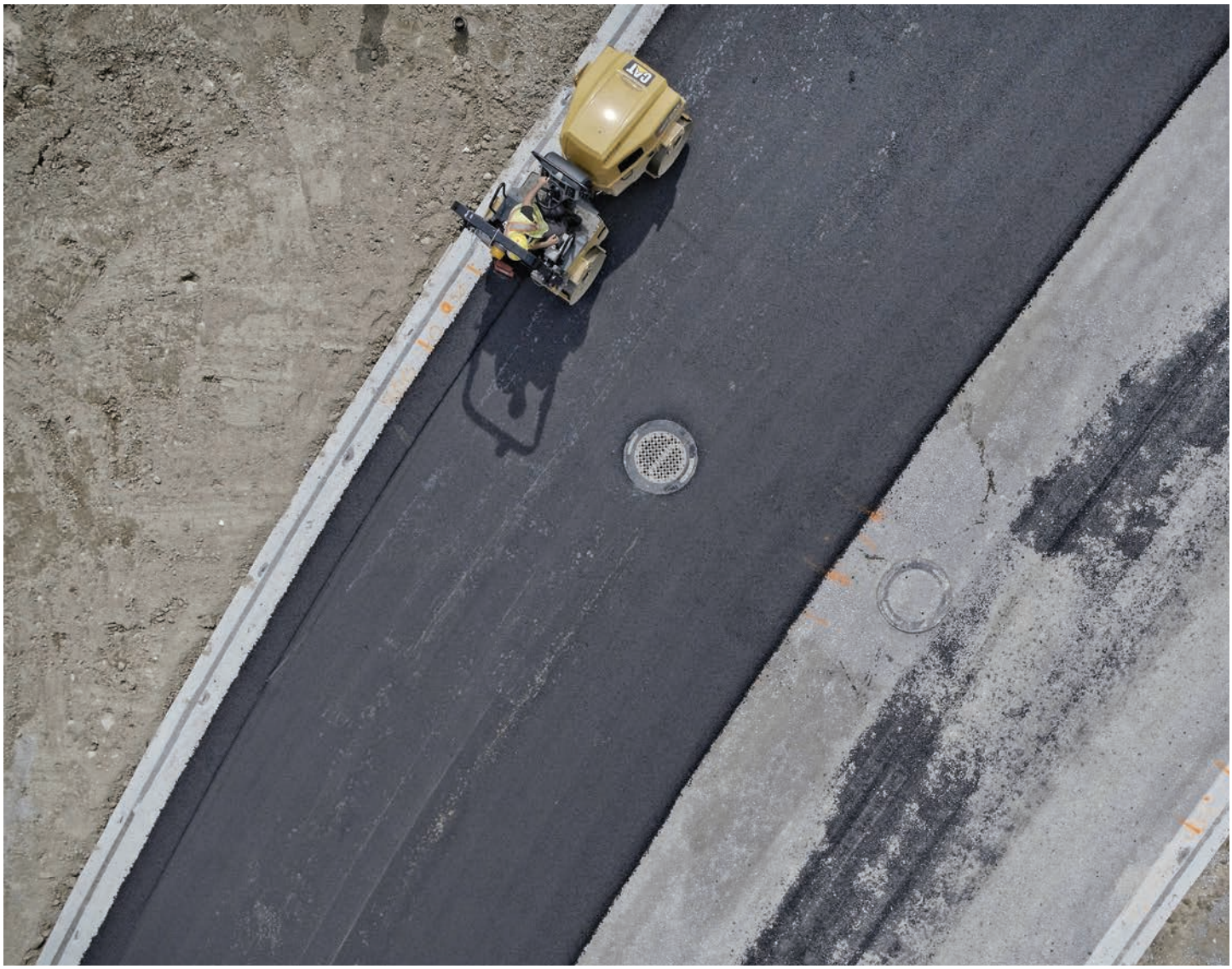
IFC·25

MATERIAL 25 YEAR GUARANTEE

INTEGRATED FRAME & COVER MH SYSTEM

BENEFITS & COST SAVINGS REPORT



INTEGRATED FRAME & COVER (IFC-25) MAINTENANCE HOLE SYSTEM

BENEFITS & COST SAVINGS REPORT

TABLE OF CONTENTS

IFC·25

EXECUTIVE SUMMARY

Unchanged for half a century, the conventional maintenance hole design is now a frequent and very costly source of many problems for municipalities and taxpayers. A newer and patented enhanced maintenance hole design called the Integrated Frame and Cover Maintenance Hole System, also known as the IFC-25 MH System solves these issues. This report details the many benefits and cost savings that are gained when the IFC-25 MH System is used in place of conventional maintenance holes.

- **Each IFC-25 MH System carries a 25 year material guarantee**
- Eliminates inflow & infiltration (I/I)
- 200% longer life-cycle
- Minimizes road deterioration
- Asphalt and granular foundation is never disturbed, no cold joints are created
- Maintenance/repairs are faster and less expensive, reduces traffic disruptions
- Increases sewer capacity and groundwater recharge
- Approved, specified and licensed across Ontario
- Saves millions of taxpayer dollars
    - New Installation 30 Year Case Study (Based on 2,000 MH Units)
        - $710,000 savings/year
        - $21,300,000 total savings
    - Municipality Rehabilitation 30 Year Case Study (Based on $5M Annual Rehab Budget)
        - $3,152,778 savings/year
        - $94,583,333 total savings





MANUFACTURERS & DISTRIBUTORS

DECAST

Tyler Corcoran
705.627.8544
tcorcoran@decastltd.com

8807 County Rd 56 Utopia,
ON L0M 1T0

cedar INFRASTRUCTURE PRODUCTS

Matthew Genovese
905.882.2070
matthew@cedarcip.com

330 Rodinea Rd #1
Maple, ON L6A 4P5

Rinker MATERIALS™

Jessica Steffler
519.622.7574 x 223
jessica.steffler@forterrabp.com

2099 Roseville Road – R.R. #2
Cambridge, ON N1R 5S3

OMNI PRECAST

James Leahey
1-519-632-9112 x 221
info@mconpipe.com

2691 Greenfield Rd
Ayr, ON N0B 1E0

MCON

Mike Paquette
613.229.9545
sales@mconproducts.com

2150 Richardson Side Rd
Carp, ON K0A 1L0

INTEGRATED
FRAME&
COVER
MH SYSTEM

IFC·25


CATERPILLAR


DECAST
1200 TTI
2017-03-27
A


1200 IFC AD UNIT

IFC-25 MH SYSTEM OVERVIEW

The IFC-25 MH System is a patented (CA 2643874, filed 2008-11-14) and enhanced maintenance hole design called the Integrated Frame and Cover Maintenance Hole System, also known as the IFC-25 MH System. The IFC-25 MH System eliminates inflow and infiltration, increases sewer capacity and groundwater recharge, minimizes road deterioration, reduces MH rehabilitation cost and frequency, and provides substantial life-cycle costs savings compared to conventional maintenance hole installations.

The IFC-25 MH System can be installed on new and existing tapered tops, flat caps and chambers. Numerous municipalities and organizations are now specifying and accepting the IFC-25 MH System. Over 5,000 systems have been installed across Ontario.

To demonstrate how confident we are in the IFC-25 MH System, there is a 25-year material guarantee for all systems that are installed following the correct procedures detailed in this report. Additionally, in the event of any third-party damage to the IFC-25 frame and/or concrete components, most repairs are simple and quick using a recommended product.

WE ***GUARANTEE*** OUR PRODUCT!

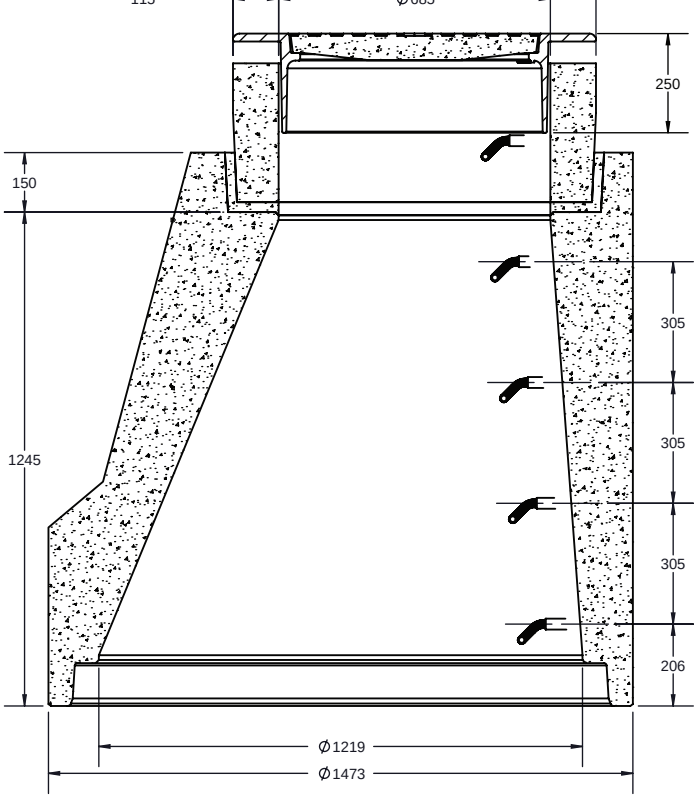
The IFC-25 MH System eliminates the currently used grade adjustment rings for conventional maintenance holes. Conventional, standard "grade rings" split and crumble allowing unwanted inflow and infiltration which accelerates deterioration and failure of the asphalt road surface and granular foundation. Constant and frequent rehabilitations of conventional MHs are required due to traffic loading and the forces of the freeze-thaw cycle.

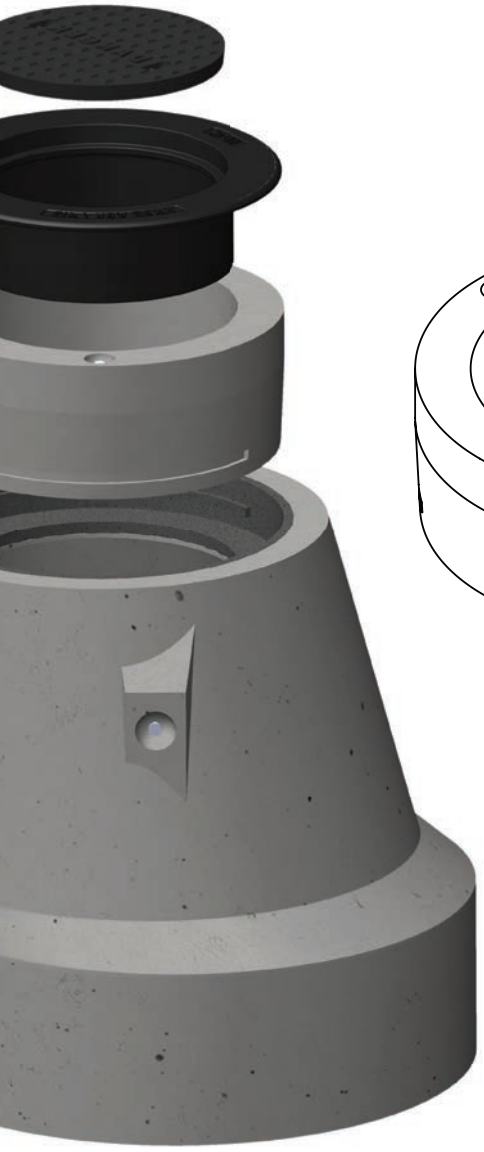
IFC-25 MH SYSTEM

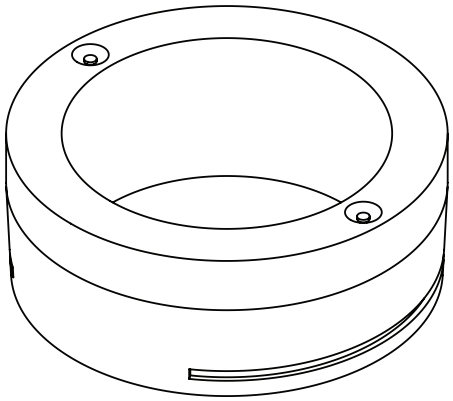
VS

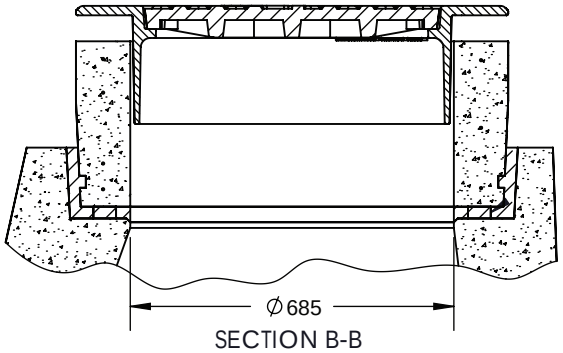
CONVENTIONAL MH

IFC-25







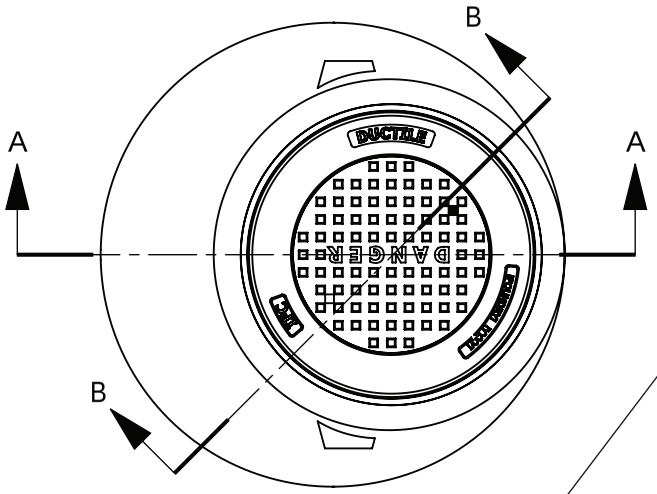


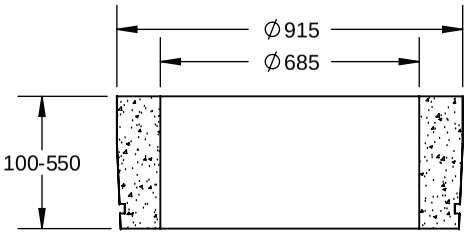
SECTION B-B
SCALE 1 : 16

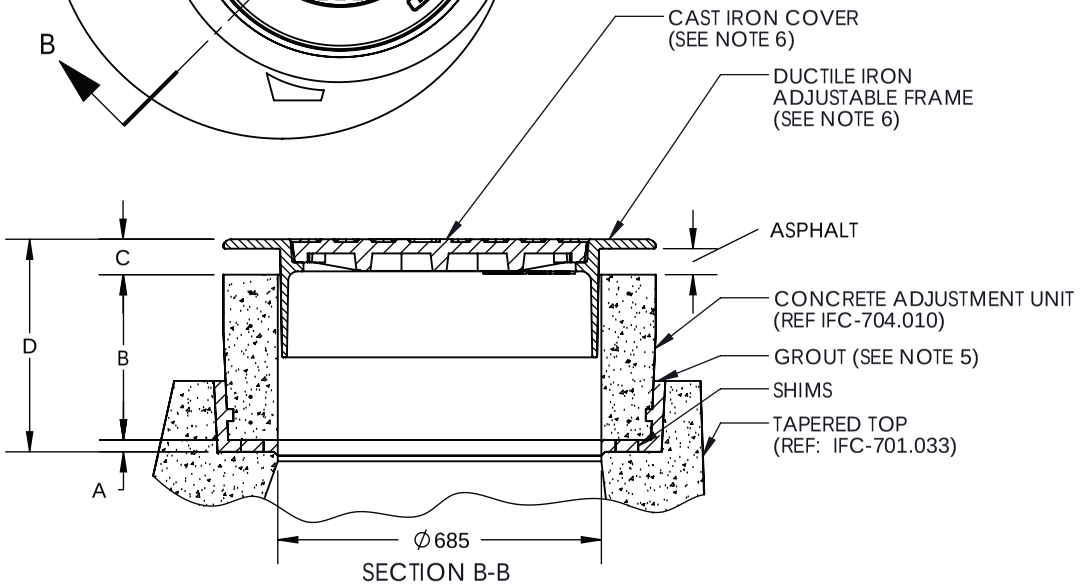
IFC-25 MAINTENANCE HOLE SYSTEM

A SOLID, ROBUST, IMPENETRABLE MH SYSTEM THAT LASTS MUCH LONGER THAN CONVENTIONAL INSTALLATIONS

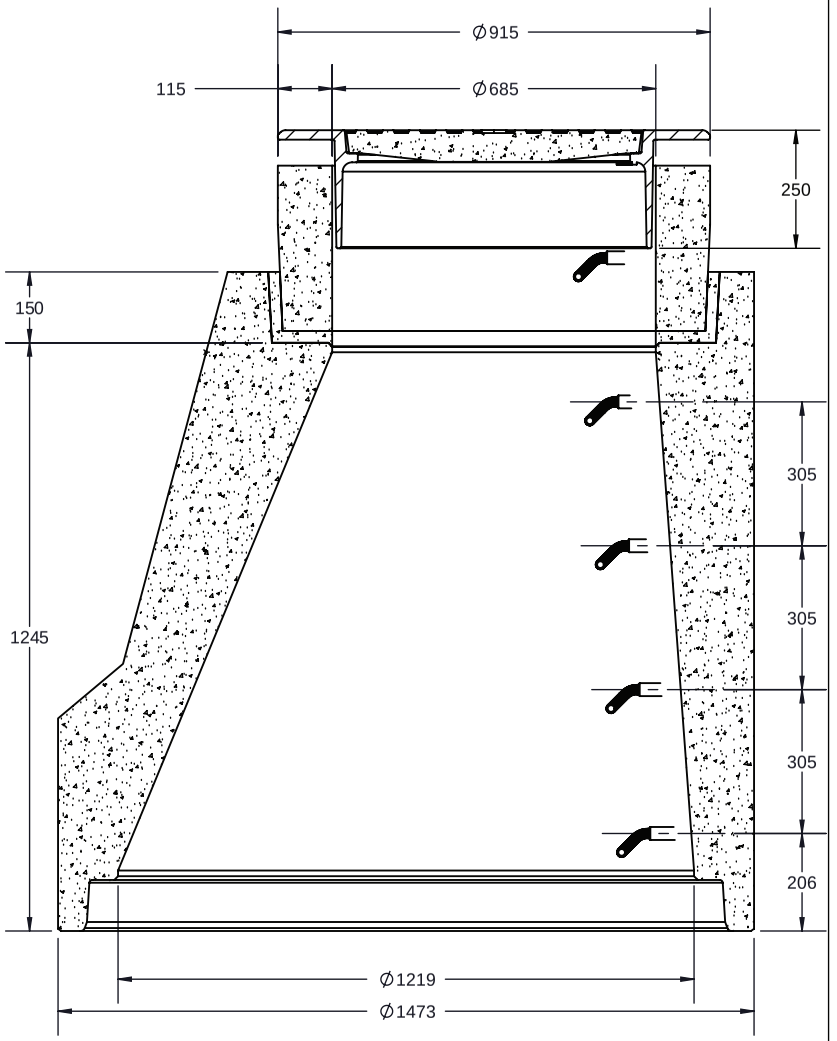
DETAILED DRAWINGS







SECTION B-B
SCALE 1 : 16



SECTION A-A
SCALE 1 : 16

DIMENSION	NOTES
A	ADJUSTMENT RANGE: 25 - 100mm.
B	STANDARD HEIGHT, CONCRETE ADJUSTMENT UNIT: 350mm. ALSO AVAILABLE: 100, 150, 200, 250, 300, 400, 450, 500, 550mm.
C	DUCTILE IRON FRAME ADJUSTMENT RANGE: 70 - 200 mm.
D	OVERALL ADJUSTMENT: MIN 195 mm (USING 100mm C.A.U.) MAX 850 mm (USING 550mm C.A.U.)

REV	DATE	RECORD OF CHANGE	BY
1	2015.02.06	MODIFIED FRAME FLANGE DIAMETER, HEIGHT. DIMS A, C, D ADJUSTED TO SUIT MODIFIED FRAME.	IB
2	2015.08.25	ADDED ADJ UNITS: 300, 400, 500	IB
3	2016.01.15	REVISED TITLE BLOCK	IB
4	2016.03.04	CORRECTED DIM 'C'.	IB
5	2018.07.10	ADJUSTED FRAME LENGTH, DIM 'C'.	IB
6	2018.09.28	'DUCTILE IRON FRAME' WAS 'CAST IRON'.	IB
7	2020.05.12	UPDATED MARKING ON FRAME	IB

1. MINIMUM CONCRETE STRENGTH AT 28 DAYS: 30 MPa.
2. REINFORCEMENT: AS PER CSA A257.4 - 09.
3. 25 mm MINIMUM COVER ON ALL REINFORCING STEEL.
4. CONCRETE ADJUSTMENT UNIT CAN BE ORIENTED TO SUIT HEIGHT AND ANGLE REQUIRED. UNIT DEPICTED IS 350mm.
5. GROUT REQUIREMENTS: NON-SHRINK; MINIMUM 50 MPa AT 28 DAYS; TO BE INSTALLED ONLY AS PER MANUFACTURER APPLICATION GUIDELINES.
6. COVER DEPICTED IS PER OPSD 401.01, TYPE A. OTHER OPS-COMPLIANT COVERS AVAILABLE.

DECAST

T: 705 734 2892
TF: 800 461 5632
F: 705 734 2920

8807 COUNTY ROAD 56
UTOPIA, ON L0M 1T0
decastltd.com

PROJECT: IFC-MH

DESCRIPTION: IFC MAINTENANCE HOLE TAPERED TOP ASSEMBLY

MATERIAL: N/A, ASSEMBLY

WEIGHT: 2436 kg

DATE: 2015.01.15

DWG №: IFC-701.030

DRAWN BY: IB

CHK'D BY: MR

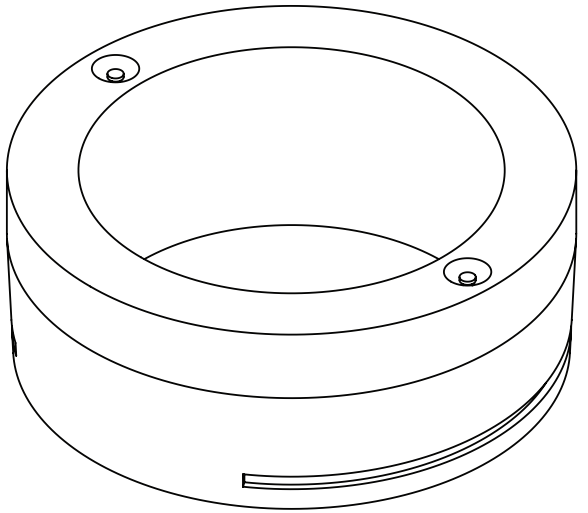
REVISED: 2020.05.12

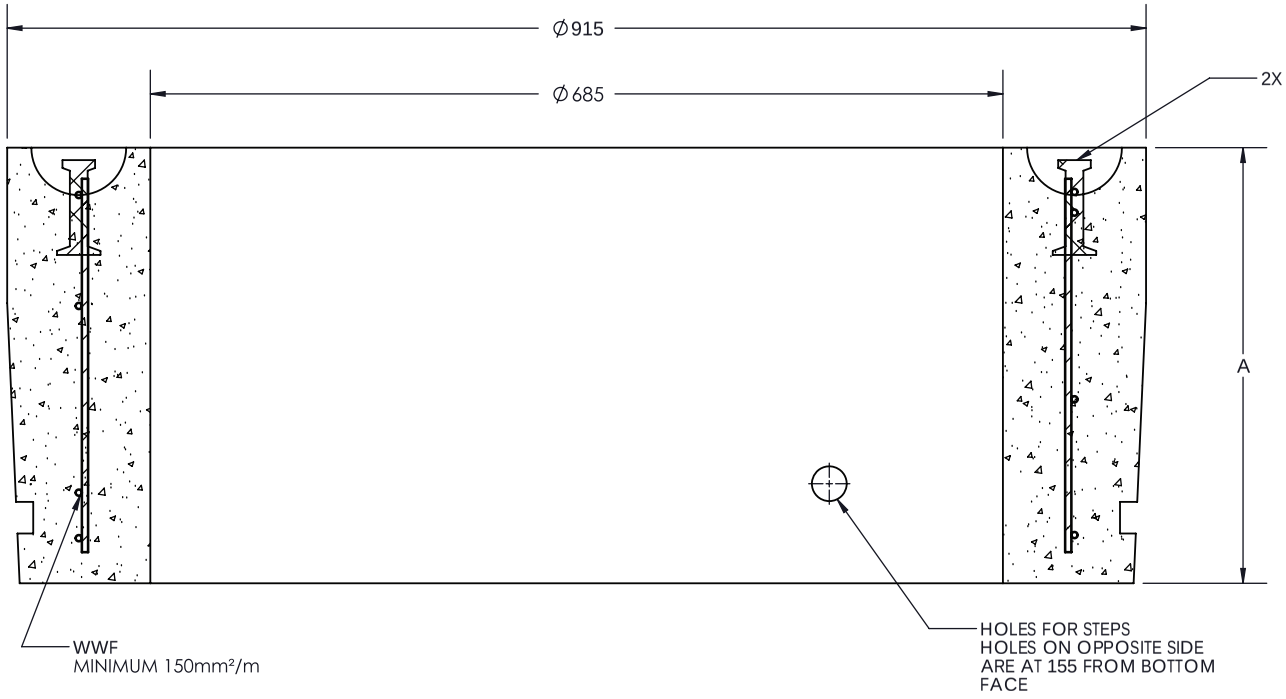
SCALE: 1:24

PAGE №: 1 OF 1

REVISION: 7

REV	DATE	RECORD OF CHANGE	BY
1	2015.05.12	ADDED 100, 300, 400	IB
2	2015.08.25	ADDED 500	IB
3	2016.01.15	REVISED TITLE BLOCK	IB





DIMENSION A	MASS (kg)
100	61
150	95
200	129
250	164
300	198
350	233
400	267
450	302
500	336
550	371

1. DESIGNED AND MANUFACTURED TO C.S.A. A257.4-09.
2. MINIMUM CONCRETE STRENGTH AT 28 DAYS: 35 MPa.
3. REINFORCEMENT MINIMUM YIELD STRENGTH: 500 MPa.
4. 25 mm MINIMUM COVER ON ALL REINFORCING STEEL.
5. REINFORCEMENT CENTERED IN WALL ±10mm.
6. 350 UNIT IS DEPICTED. DIMENSIONS SHOWN FOR 350 UNIT ARE TYPICAL FOR ALL PIECES.
7. UNITS SMALLER THAN 350 mm DO NOT HAVE STEP HOLES.
8. UNITS SMALLER THAN 250 mm USE A SINGLE REINFORCEMENT HOOP, MINIMUM W6 WIRE.

DECAST

T: 705 734 2892
TF: 800 461 5632
F: 705 734 2920

8807 COUNTY ROAD 56
UTOPIA, ON L0M 1T0
decastltd.com

PROJECT: IFC-MH

DESCRIPTION: IFC CONCRETE ADJUSTMENT UNIT

MATERIAL: AS NOTED

WEIGHT: 129 kg

DATE: 2015.01.15

DWG Nº: IFC-704.010

DRAWN BY: IB

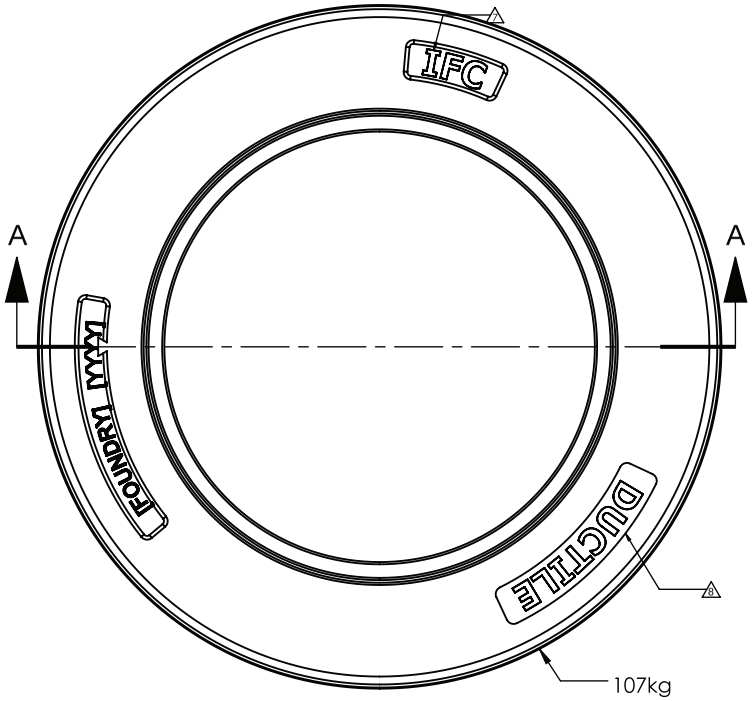
CHK'D BY: MR

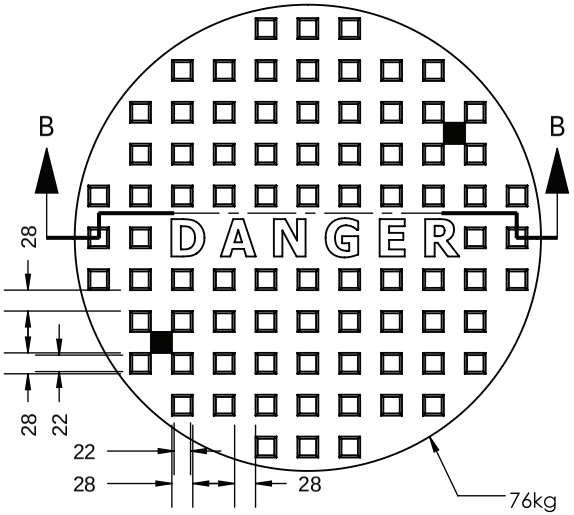
REVISED: 2016.01.15

SCALE: 1:12

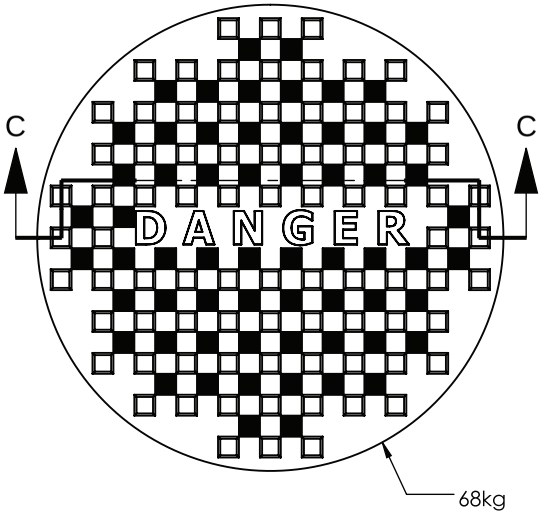
PAGE Nº: 1 OF 1

REVISION: 3

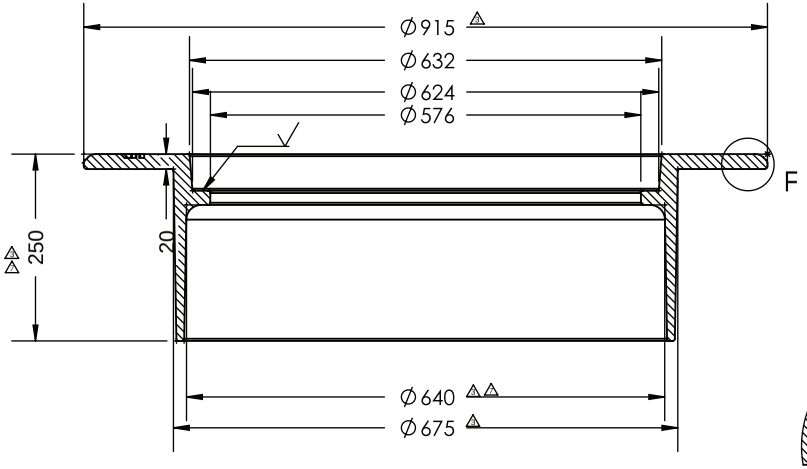




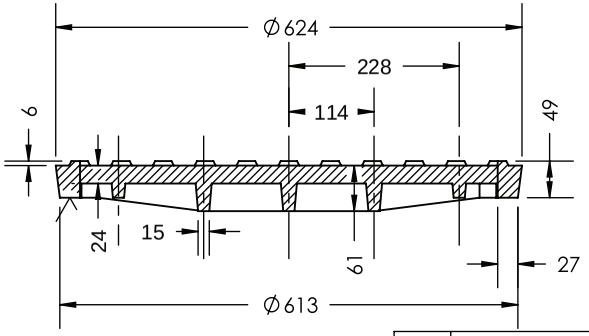
TYPE A
CLOSED COVER



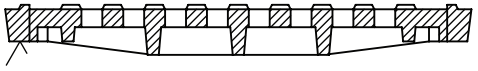
TYPE B
OPEN COVER



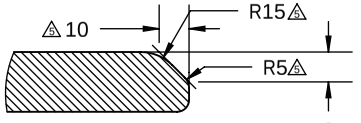
SECTION A-A



SECTION B-B



SECTION C-C



DETAIL F
SCALE 4 : 10

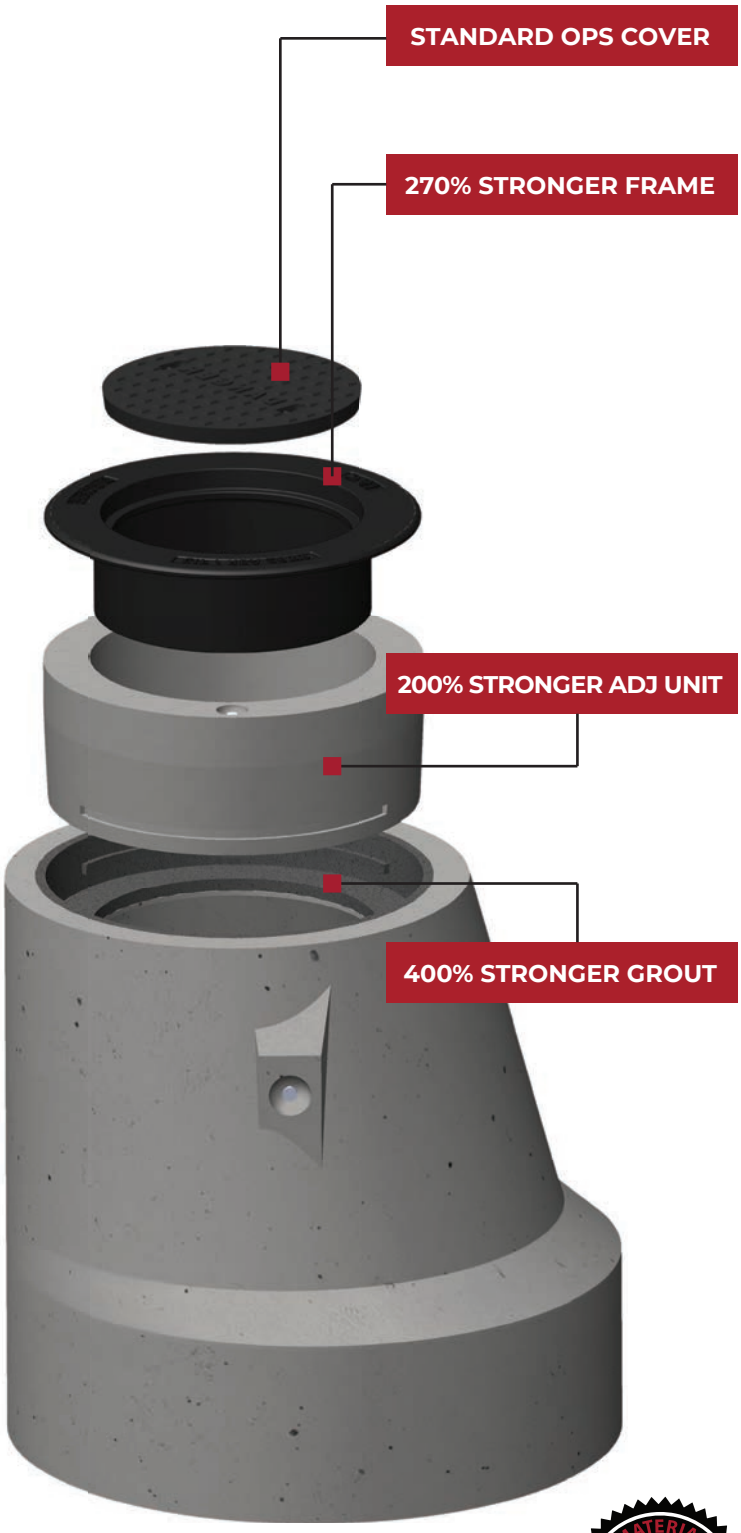
REV.	DESCRIPTION	DATE	BY
8	ADDED "DUCTILE" EMBOSSING.	2020.05.12	IB
7	FRAME MATERIAL WAS GREY CAST IRON. HEIGHT WAS 185, BARREL ID WAS Ø646. REMOVED "DECAST LTD." EMBOSSING.	2018.06.15	IB
6	CLARIFIED COMPONENT WEIGHTS. NO DESIGN CHANGES	2017.05.01	IB
5	ADDED TOP EDGE CHAMFER	2016.06.24	IB
4	UPDATED TITLE BLOCK	2016.01.15	IB
3	FRAME: Ø915 WAS Ø860, Ø875 WAS Ø860, 190 WAS 225	2015.02.04	IB
2	UPDATED FRAME: REMOVED LIFT POINTS, PERIMETER CHAMFER	2014.11.10	IB

NOTES
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. COVER MATERIAL: AS PER OPSS 1850.
3. FRAME MATERIAL: DUCTILE IRON ASTM A536 CLASS 80-55-06
4. DIMENSIONS OF TYPE A AND B COVERS ARE THE SAME, EXCEPT FOR VENT HOLES IN TYPE B.

DECAST
T: 705 734 2892
TF: 800 461 5632
F: 705 734 2920
8807 COUNTY ROAD 56
UTOPIA, ON L0M 1T0
decastltd.com

PROJECT: IFC-MH
DESCRIPTION: IFC-MH FRAME AND COVER
MATERIAL: AS NOTED
WEIGHT: 183 kg
DATE: 2015.01.15
DWG Nº: IFC-401.010
DRAWN BY: IB
CHK'D BY: MR
REVISED: 2020.05.12
SCALE: 1:10
PAGE Nº: 1 OF 1
REVISION: 8

SYSTEM COMPONENTS



Standard OPS Cover

IFC-25 Frame accepts the standard ⌀ 624mm OPS cover

Ductile Iron Integrated Frame

A telescopic ductile iron frame fits into the monolithic concrete structure. The IFC-25 frame is embedded within the asphalt road surface, eliminating failures caused by freeze-thaw cycles. Adjusting the IFC-25 frame and OPS cover from base to final asphalt is faster, easier and causes no disruption to the existing pavement structure. Additionally, future repairs are simple, fast and inexpensive. The IFC-25 frame is 270% stronger than the old, conventional cast iron frame

Precast Adjustment Unit

Instead of multiple dry cast grade rings, the IFC-25 has a 200% stronger single wet cast precast adjustment unit, extending the solid structure from below. Sizes range from 100mm to 550mm in 50mm increments

Engineered, High-Strength Grout

The joint between the adjustment unit and tapered top is permanently sealed by an engineered, prepackaged, rapid-setting, easily flowable, high-strength non-shrink grout (50MPa), sets in 20 to 30 minutes. This grout is 400% stronger than conventional mortar.

IFC-25 Tapered Top

The IFC-25 MH System has a revised tapered top section to accommodate one solid precast grade adjustment unit. Conventional tapered tops are standard dry cast concrete and the IFC-25 Tapered Tops are high quality wet cast concrete

QUALITY STANDARDS

DECAST, OMNI Precast, M CON Products and Rinker Materials produce and Cedar Infrastructure Products distributes a large variety of precast concrete elements for multiple infrastructure and construction sectors. The following organizations create codes and standards that DECAST uses and conforms to regularly; ACI - American Concrete Institute, ASTM - American Society for Testing and Materials, AWWA - American Water Works Association, CPCI - Canadian Precast Concrete Institute, CSA - Canadian Standards Association, OPS - Ontario Provincial Standards and PCI - Precast Concrete Institute.

CPCQA CERTIFICATION PROGRAM

DECAST, OMNI Precast, M CON Products and Rinker Materials are CPCQA certified plants. The purpose of the Canadian Precast Concrete Quality Assurance (CPCQA) Certification is to protect and serve the public from a safety perspective, by certifying precast concrete manufacturers who demonstrate the ability to meet national standards and other best practices.

IFC-25 CONCRETE COMPONENTS

IFC-25 concrete components comply with CSA A257.4 - Precast Reinforced Circular Concrete Manhole Sections, Catch Basins, and Fittings and CSA S6 - Canadian Highway Bridge Design Code. All manufacturers mix and batch concrete using state-of-the-art batching equipment and temperature and moisture-controlled cements and aggregates. Concrete mixes conform to OPS 1350 or other governing authority concrete mix requirements. For all projects, curing processes comply with the applicable CSA standards and follows the requirements detailed in the contract documents.

IFC-25 DUCTILE IRON FRAME

OPS 1850 states frames are to be ASTM A48M, Class No. 30B (gray cast iron) or ASTM A536, Grade 65-45-12 (ductile iron). Old, conventional frames are gray cast iron and the weaker of the two options. The IFC frames are a high grade of ductile iron (ASTM A536, Class 80-55-06) that exceeds the OPS 1850 ductile iron requirements.

OLD, CONVENTIONAL MH FRAME ASTM A48M, Class No. 30B	IFC-25 DUCTILE IRON FRAME ASTM A536, Class 80-55-06
Tensile Strength: 207MPa • Maximum stress, breaks/fails at this point	Tensile Strength: 552MPa • 345MPa higher than conventional frames
Yield Strength: No Minimum Defined • Brittle material, will break not bend when dropped or hit (i.e. snowplows)	Yield Strength: 379MPa • Handles high impact forces without bending or breaking
IFC-25 DUCTILE IRON FRAME: 270% STRONGER, 350-500% HIGHER IMPACT RESISTANCE	

IFC-25 LIFE-CYCLE COST SAVINGS

Not only is the IFC-25 MH System a more robust design compared to conventional maintenance holes, switching to IFCs can also save municipalities and taxpayers millions of dollars. Detailed below are case studies comparing total costs over 30 years for new and rehabilitation installations, IFC-25 MH System vs Conventional Maintenance Holes.

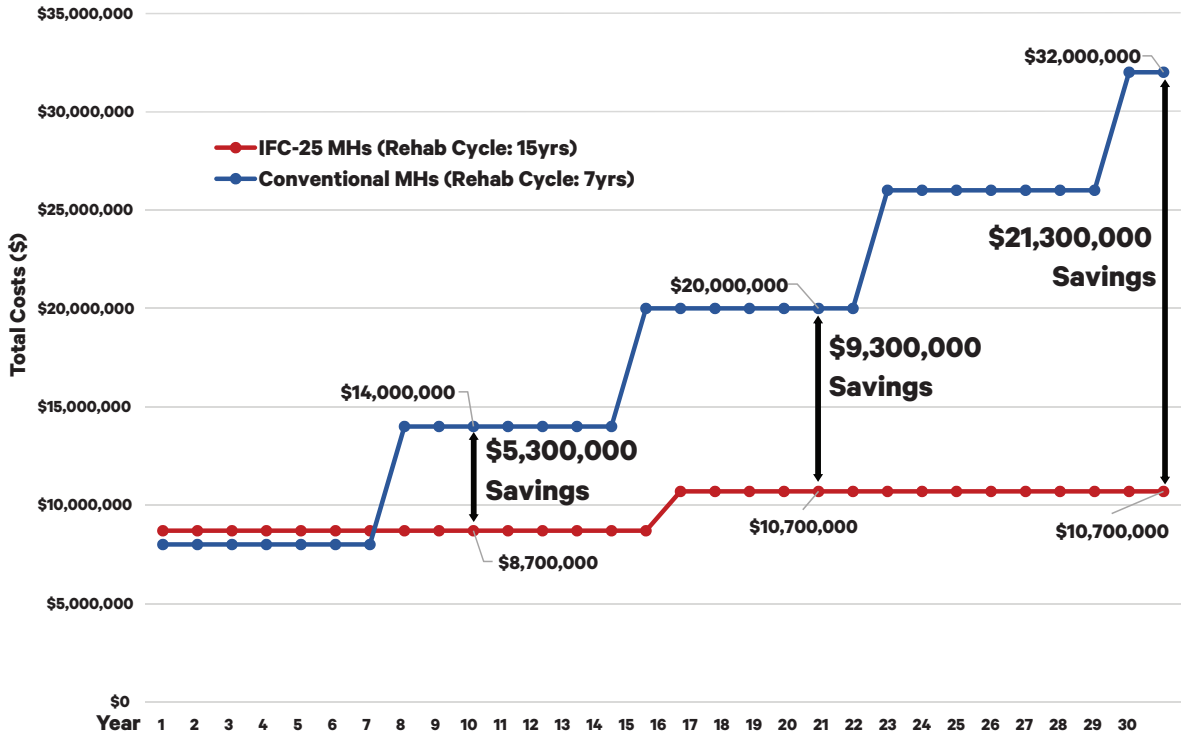
NEW INSTALLATIONS - CASE STUDY

NEW MH INSTALLATIONS IN A MUNICIPALITY: 2,000 MAINTENANCE HOLES

- Multiple new subdivisions and/or new road, watermain and sewer construction
- Isolated scenario, no external MHs considered for rehabilitation cycle

OLD, CONVENTIONAL MAINTENANCE HOLES	IFC-25 MH SYSTEM
Conventional MH new install cost: **$3500-$4500/MH** • *Costs from various GTA contractors*	IFC-25 MH System new install cost: **$3800-$4900/MH** • *Costs from DECAST's database*
Conventional MH rehab frequency: **every 5-7 years** • *Realistic frequency from Ontario municipalities*	IFC-25 asphalt repair frequency: **every 12-15 years** • *Projected frequency by DECAST*
Conventional MH rehab cost: **$2000-$5000/MH** • *Costs from various GTA contractors*	IFC-25 infrared asphalt repair: **$500-$1500/MH** • *Costs from DECAST's database*
RESULTS IN: $3,152,778 IFC-25 SAVINGS / YEAR	

IFC-25 VS CONVENTIONAL MAINTENANCE HOLES (MH) SYSTEMS
2,000 NEW INSTALLATIONS WITH FUTURE REHABILITATIONS
TOTAL COSTS OVER 30 YEARS



MH REHABILITATIONS

MH REHABILITATIONS - CASE STUDY

MUNICIPAL MAINTENANCE HOLE REHABILITATION ANNUAL BUDGET: $5,000,000

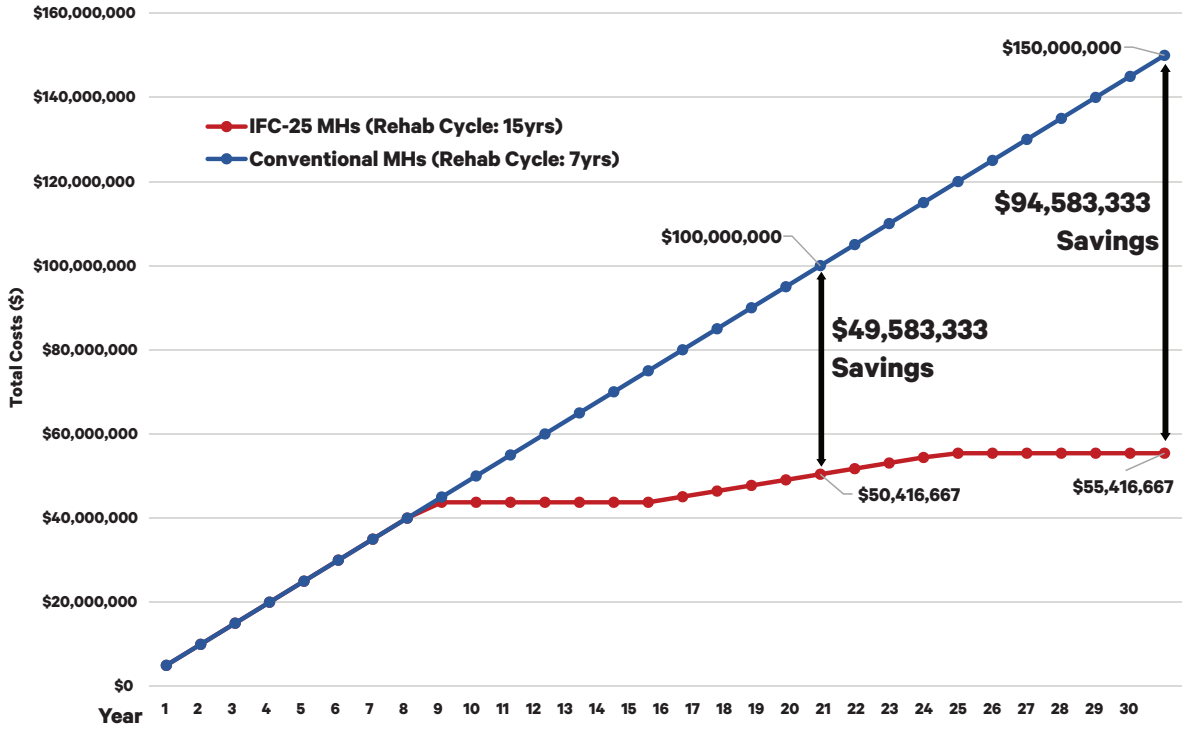
- Typical for large GTA municipalities

NUMBER OF MH'S IN REHABILITATION CYCLE: 11,667 MAINTENANCE HOLES

- 7 years of max amount of conventional MH rehabilitations while remaining in budget

OLD, CONVENTIONAL MAINTENANCE HOLES	IFC-25 MH SYSTEM
Conventional MH rehab cost: **$2000-$5000/MH** • Costs from various GTA contractors • 1,667 MHs/year to be in budget	Conventional IFC-25 conversion/rehab: **$3500-$4000/MH** • Costs from DECAST's database • 1,333 MHs/year to be in budget
Conventional MH rehab frequency: **every 5-7 years** • Realistic frequency from Ontario municipalities	IFC-25 asphalt repair frequency: **every 12-15 years** • Projected frequency by DECAST
Conventional MH rehab cost: **$2000-$5000/MH** • Future rehabs are the same cost as initial rehabs	IFC-25 infrared asphalt repair: **$500-$1500/MH** • Costs from DECAST's database
RESULTS IN: $3,152,778 IFC-25 SAVINGS / YEAR	

IFC-25 VS CONVENTIONAL MAINTENANCE HOLES (MH) SYSTEMS
EXISTING MH REHABILITATIONS - $5M ANNUAL BUDGET
TOTAL COSTS OVER 30 YEARS



APPROVAL & ENDORSEMENT

City of PICKERING

The City of Pickering has had the opportunity to evaluate the performance of the DECAST Integrated Frame and Cover Maintenance Hole System (IFC-25) which has been installed in the Seaton Community since late 2016.

The City is satisfied with the system's design features, future maintenance benefits and cost reductions, and the 25 year material guarantee for all systems that are installed in accordance to specifications.

As a result, in order to maintain consistency with the Seaton Community, the City of Pickering will be specifying the DECAST Integrated Frame and Cover Maintenance Hole System (IFC-25) exclusively.

Toronto and Region Conservation for The Living City

After reviewing the DECAST Ltd IFC-25 Maintenance Hole System, I would like to provide the following endorsement letter for the use of this product within theToronto and Region Conservation Authority (TRCA) jurisdiction. While theTRCA continues to search out innovative methods for meeting its objectives, including sustaining the existing biodiversity within our existing valley systems and remaining involved in our communities, our municipal and Regional partners typically handle regulation and maintenance of linear infrastructure systems including storm and sanitary systems. However, thewater proofing improvements provided by the IFC-25 Maintenance Hole System also can provide environmental benefits to our communities and the natural valley system through reducing the amount of surface water inflow into a sewer system during storm events. Reducing the amount of surface runoff from entering a sanitary sewer system can be beneficial for communities and the natural valley lands by:

- Reducing the number of times treatment plants surcharge and overflow to potentially environmentally sensitive areas;
- Reducing the impacts of climate change that can result in sanitary backups, currently affecting a number of communities (basement flooding, etc); and
- Improve the efficiency of existing treatment plant systems.

From the perspective of a Conservation Authority, I am confident that the IFC-25 Maintenance Hole System will benefit both our communities and the receiving natural valley systems, and encourage its use within the jurisdiction.

CURRENT STATUS & SUMMARY

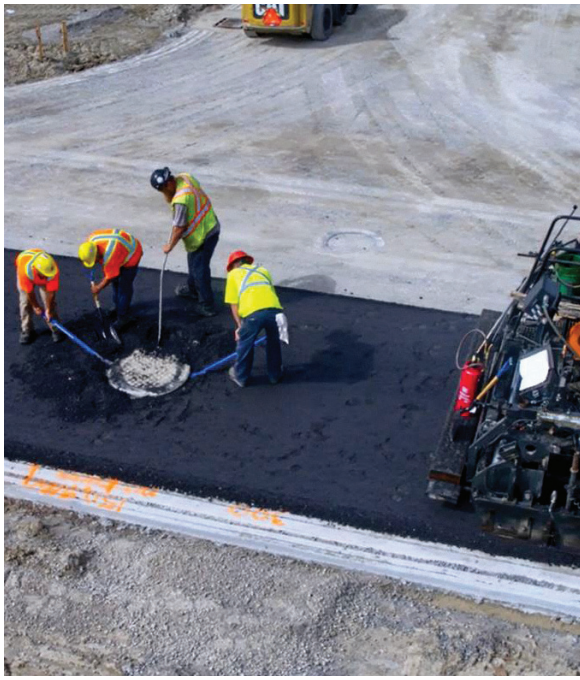
Over 5,000 IFC-25 MH Systems have been installed across Ontario in the past decade with numerous municipalities piloting, accepting for use, adding the system to specifications and approved product listings and now making IFC-25 a mandatory requirement for F&C's on roadways.

The IFC-25 MH System is a superior system compared to the conventional maintenance hole design and is transitioning into the preferred municipal standard. By employing the IFC-25 MH System, you eliminate inflow and infiltration, replace the conventional cast iron frame with a 270% stronger ductile iron frame, replace fragile grade rings, minimize road deterioration, prolong the rehabilitation cycle and save significant sums of tax payer dollars.

SUPERIOR IFC-25 ADJUSTMENT METHOD

The adjustment method for the IFC-25 MH System eliminates the time consuming, costly and inadequate steps that occur during conventional maintenance hole adjustments. When adjusting an IFC-25 MH System from base course asphalt to final (surface) course asphalt in new installation projects, as well as for existing IFC-25 adjustments, the IFC-25 MH System provides the following advantages:

- **ABSOLUTELY NO SAWCUTTING OF THE BASE ASPHALT IS REQUIRED**
- The IFC-25 frame is simply loosened from the asphalt using a pick
- The IFC-25 adjustment is completed during the placement of asphalt in a matter of minutes
- The asphalt and granular foundation surrounding the maintenance hole is never disturbed and remains properly compacted and stable
- Reduces construction time and minimizes traffic disruptions
- Cold joints are eliminated, base asphalt is not cut and remains strong
- The better IFC-25 design makes for a far superior system that is more robust, has a longer life-cycle and has the potential to save millions of dollars



IFC·25

INTEGRATED FRAME & COVER SYSTEM

NEW INSTALLATIONS

www.ifcmhsystem.com

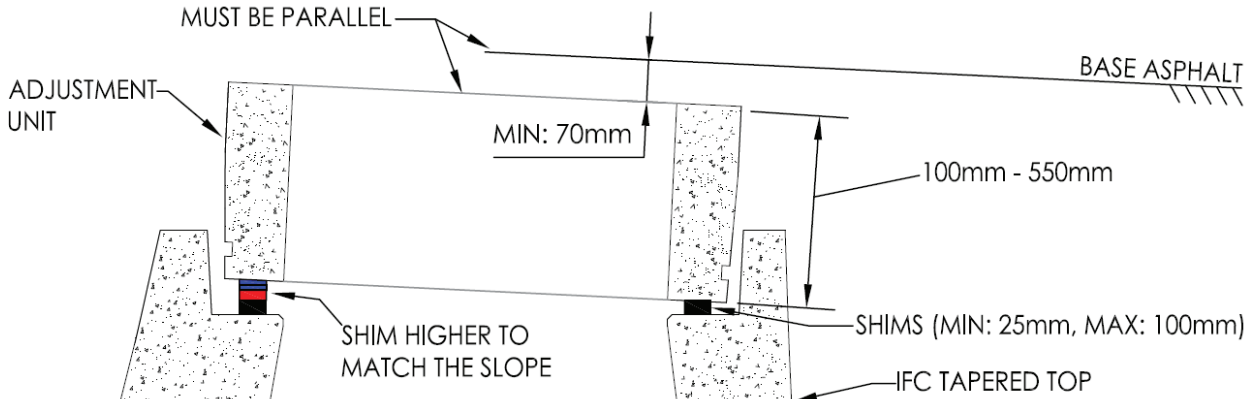
INSTALLATION PROCESS

For new IFC-25 MH System installations, the IFC-25 tapered top (with the grouting bell as described above) is used. The lower sections up to the tapered top are the same as the conventional design. To rehabilitate existing conventional maintenance holes, or installations on flat tops and chambers, the IFC-25 system can still be used but the installation procedure has some simple modifications.

NEW INSTALLATIONS

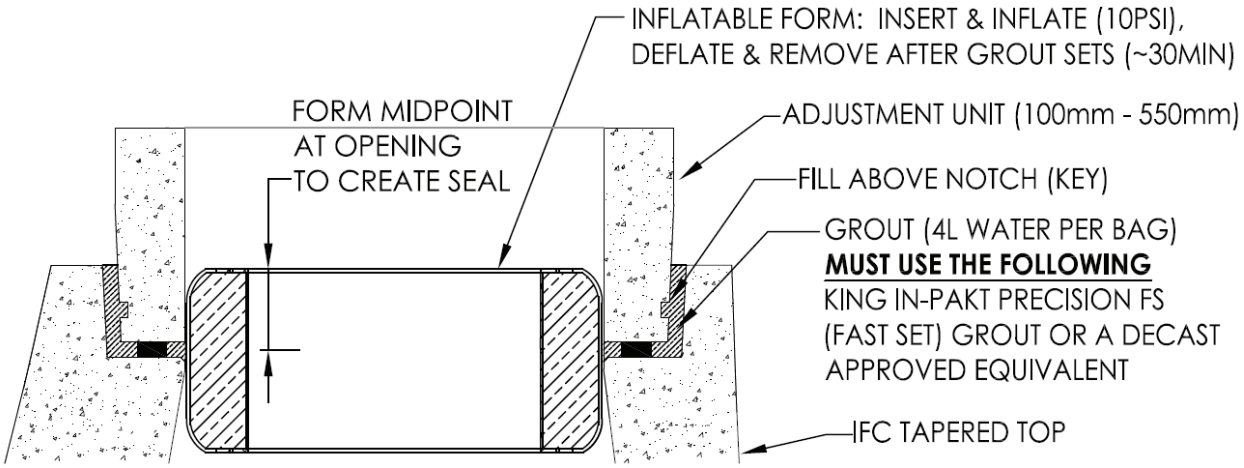
STEP 1: SETTING THE CONCRETE ADJUSTMENT UNIT

- Once the road is constructed, the maintenance hole is to be adjusted to grade
- Measurements are taken and an adjustment unit size is selected, available in 50mm increments, 100mm - 550mm
- The adjustment unit is placed on HDPE shims to match the subbase height and required cross slope
- The top of the adjustment unit is to be 70mm minimum lower than the specified base course asphalt layer (50mm for asphalt and 20mm for the frame thickness)



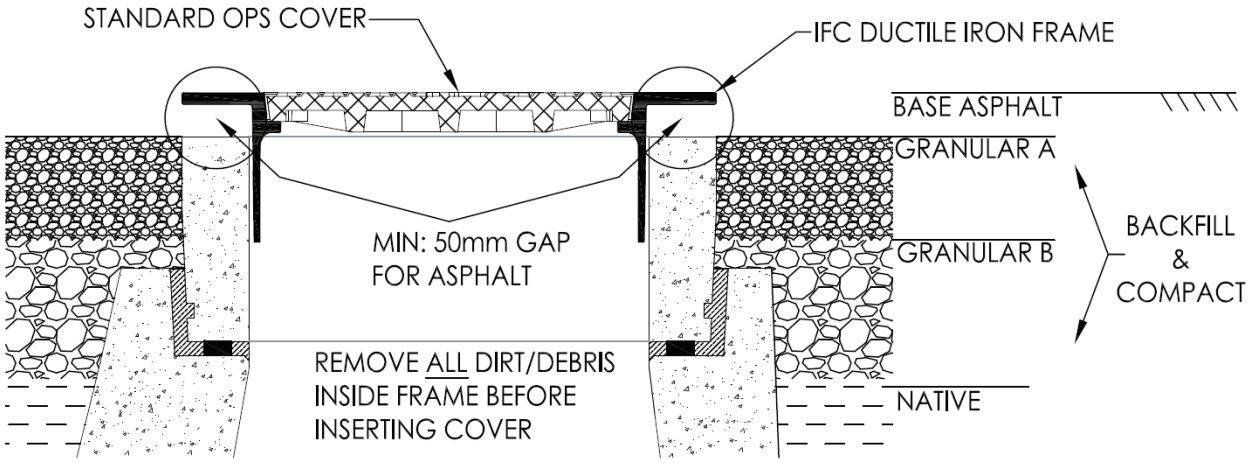
STEP 2: GROUT JOINT TO CREATE A MONOLITHIC STRUCTURE

- An interior inflatable form creates a watertight seal to allow grout to be poured on the exterior to permanently bond the adjustment unit to the tapered top
- The prepackaged, high-strength grout is mixed on-site to a fluid consistency to uniformly fill the joint. The shims are encapsulated within the grout
- Removing the form reveals a clean finished surface that requires no further work



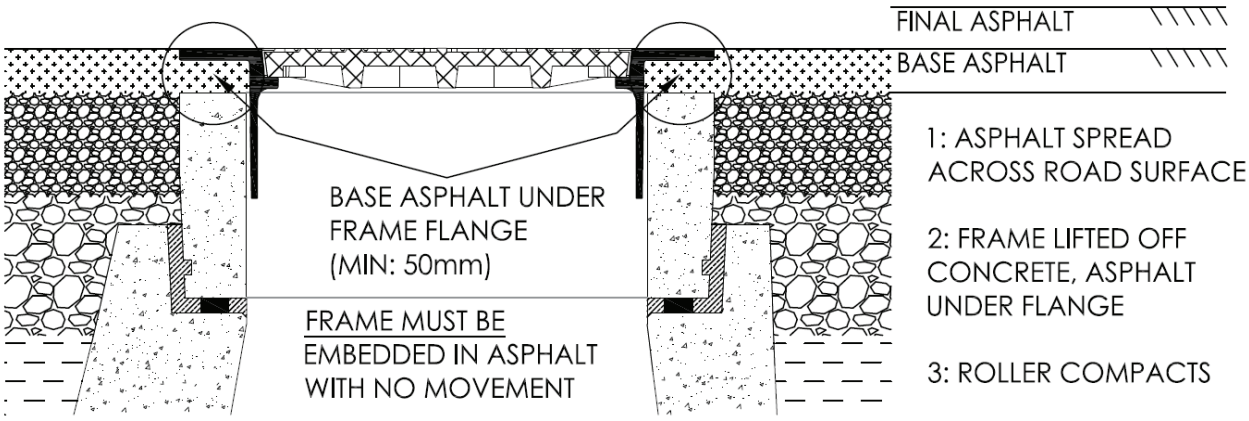
STEP 3: INSTALL IFC-25 FRAME, STANDARD COVER, BACKFILL AND COMPACT

- The telescopic ductile iron frame and standard OPS cover are set into the concrete monolithic structure
- The surrounding road subbase granular material is reinstated up to the top surface of the adjustment unit and compacted



STEP 4: BASE COURSE ASPHALT

- An asphalt paver spreads asphalt across the entire road surface and drives directly over the IFC-25 MH System. The crew following the paver adjusts the frame and cover during the process
- A minimum of 50mm of asphalt between the frame flange and concrete adjustment unit at base course asphalt is required
- Asphalt rollers drive directly over the frame and cover, compacting the asphalt under the frame flange and surrounding area, this ensures proper cushioning and embeds the system into the road surface

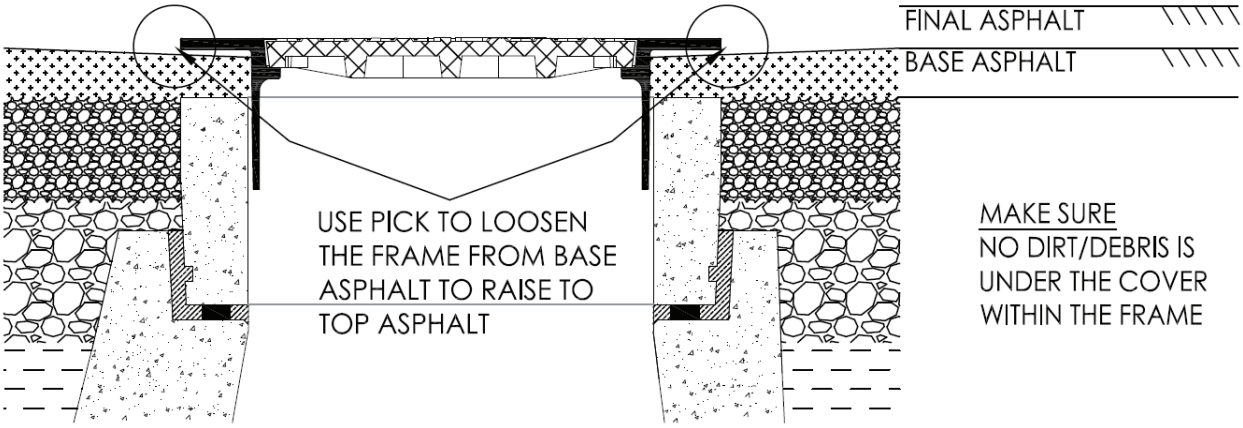


STEP 5: FINAL (SURFACE) COURSE ASPHALT PREPARATION

- For final (surface) asphalting, the conventional MH installation requires cutting the base asphalt, excavating the granular material, and mortaring additional grade rings.

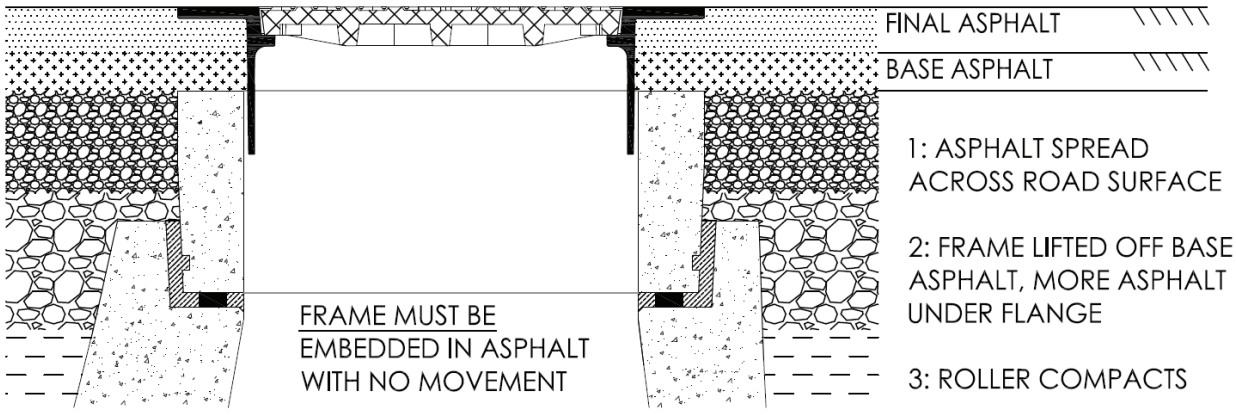
  The IFC-25 MH System eliminates these time-consuming, expensive steps!

- The base course asphalt and subbase are not disturbed during the placement of the final lift of asphalt. The frame is simply loosened using a pick or jackhammer chisel to raise the frame to the final height during the asphalting process



STEP 6: FINAL (SURFACE) COURSE ASPHALT

- Similar to Step 4: Base Course Asphalt, an asphalt paver spreads asphalt across the entire road surface and drives directly over the IFC-25 MH System. The crew following the paver adjusts the frame and cover using pry bars
- An additional 50mm of asphalt is compacted between the frame flange and concrete adjustment unit
- Asphalt rollers drive directly over the frame and cover, compacting the asphalt under the frame flange and surrounding area
- The IFC-25 MH System is embedded in the road surface, as the road moves with the forces of the freeze-thaw cycle the frame remains flush and level, while the underground structure remains impenetrable, which protects the surrounding granular foundation



OLD, FLAWED CONVENTIONAL MAINTENANCE HOLE ADJUSTMENT METHOD

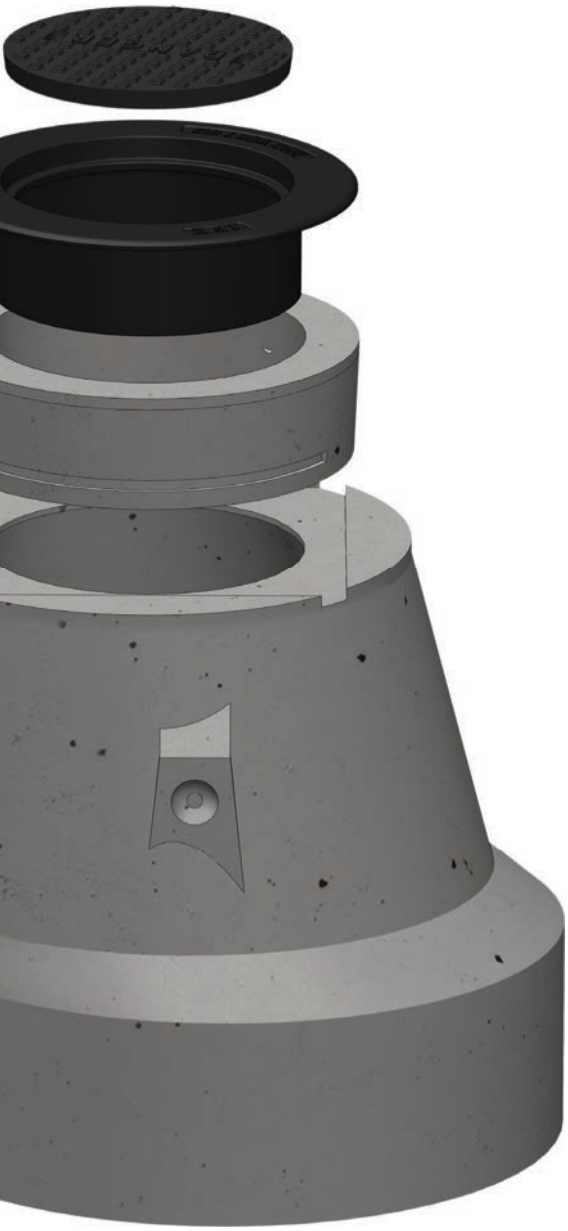
The conventional method requires the mobilization of heavy equipment, including mobile saws and articulating excavation equipment in order to adjust maintenance holes in preparation for final (surface) course asphalt, as well as for maintenance hole rehabilitation projects. This method is flawed for the following reasons:

- The asphalt surface and granular foundation surrounding the maintenance hole is significantly disturbed and is no longer stable when a square perimeter is sawcut in to the asphalt and excavation of the compacted material takes place
- Not only is the asphalt and granular foundation completely compromised, sawcutting asphalt and excavating existing road material is time consuming, disruptive and costly
- The conventional method takes 1-2 hours per MH to adjust in preparation for final course asphalt, typically days before
- Broken grade rings (moduloc) are very common and are constantly being replaced, often they fail after only 1-2 years due to poor design and point loading
- When reinstating the surrounding material, adequate compaction and level of stability comparable to its original construction condition is rarely achieved, therefore increasing road deterioration, inflow and infiltration
- Cold joints are created along the sawcut perimeter which leads to the final asphalt surface to crack and fail many years before it should, wasting many labour hours and costing thousands of dollars for each maintenance hole

REMOVING ASPHALT, CREATING A COLD JOINT

IFC·25

INTEGRATED FRAME & COVER SYSTEM



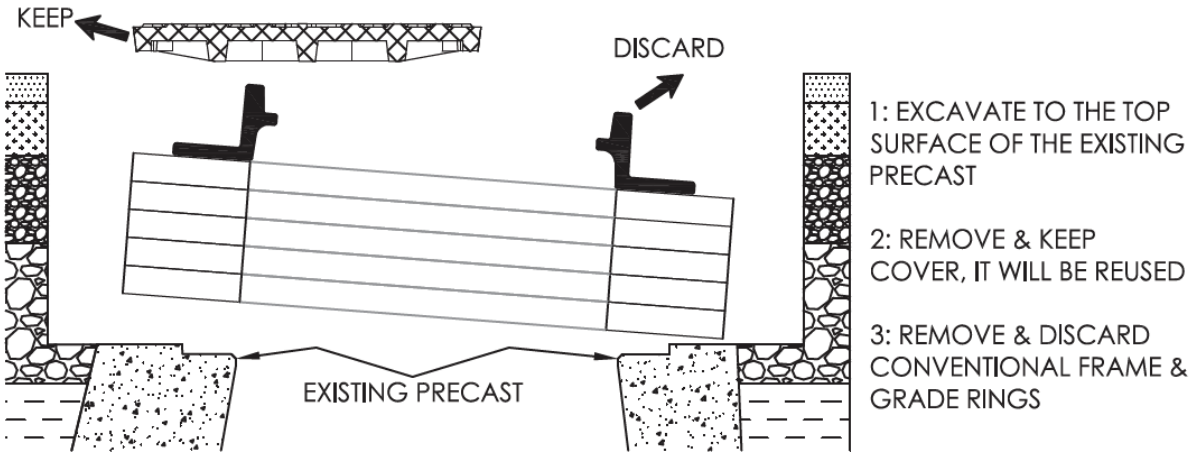
REHABILITATION, FLAT TOP & CHAMBER INSTALLATIONS

INSTALLATION PROCESS

REHABILITATION, FLAT TOP AND CHAMBER INSTALLATIONS

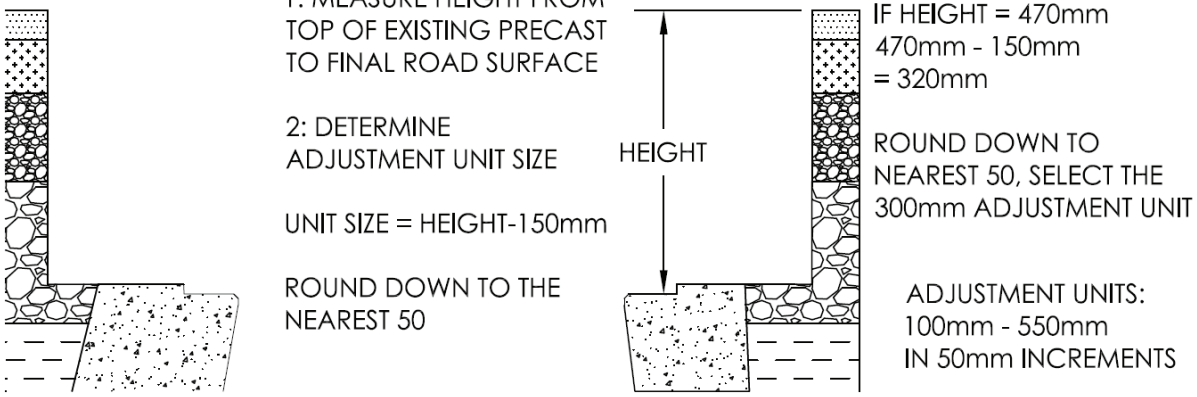
STEP 1: EXCAVATION (ONLY FOR EXISTING MHS)

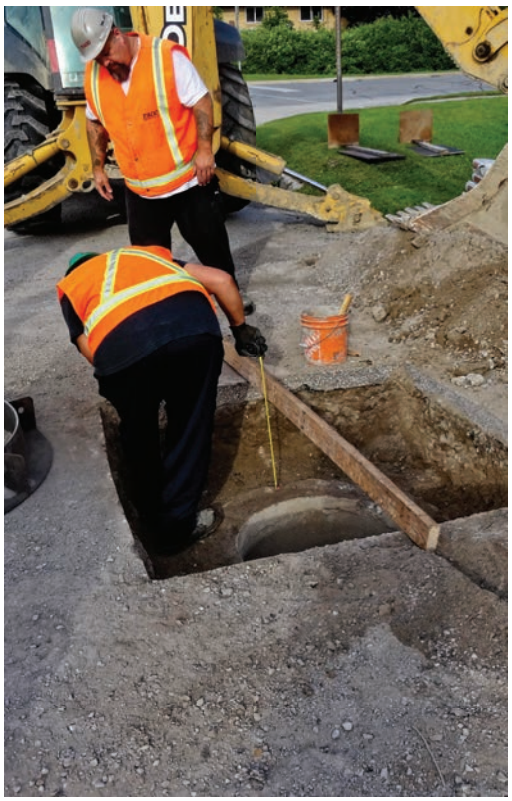
- Sawcut a square perimeter and excavate down to the conventional tapered top, flat top or chamber and remove existing grade rings
- Typically, the cover can be reused and the conventional MH frame and most likely broken grade rings are discarded



STEP 2: MEASURE & SELECT THE CONCRETE ADJUSTMENT UNIT

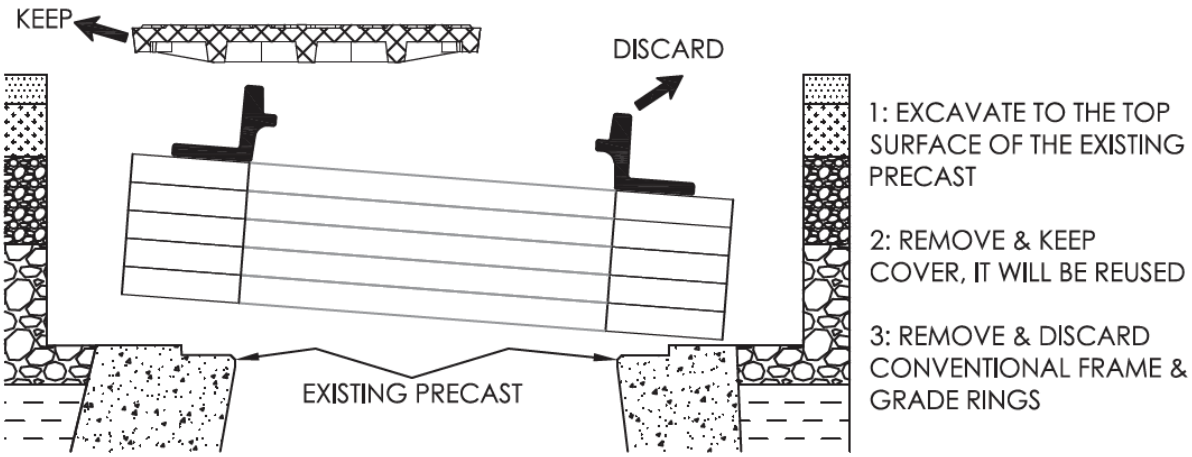
- Measurements are taken and an adjustment unit size is selected, available in 50mm increments from 100mm - 550mm





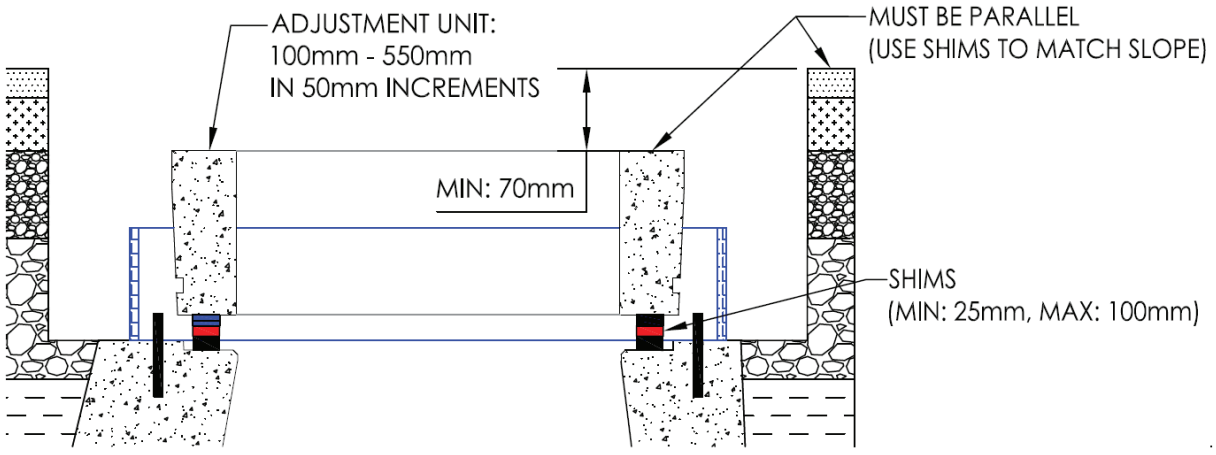
STEP 3: SET SONOTUBE & INSTALL REBAR STIRRUPS

- Center a 40” cardboard sonotube around the opening of the tapered top, flat top or chamber
- Using a hammer drill, drill 4 sets of 1/2” holes spaced evenly around the opening, 50mm within the sonotube, to install the curb stirrups
- This step creates the “grouting bell” that the revised IFC-25 tapered top has to accommodate one solid precast grade adjustment unit



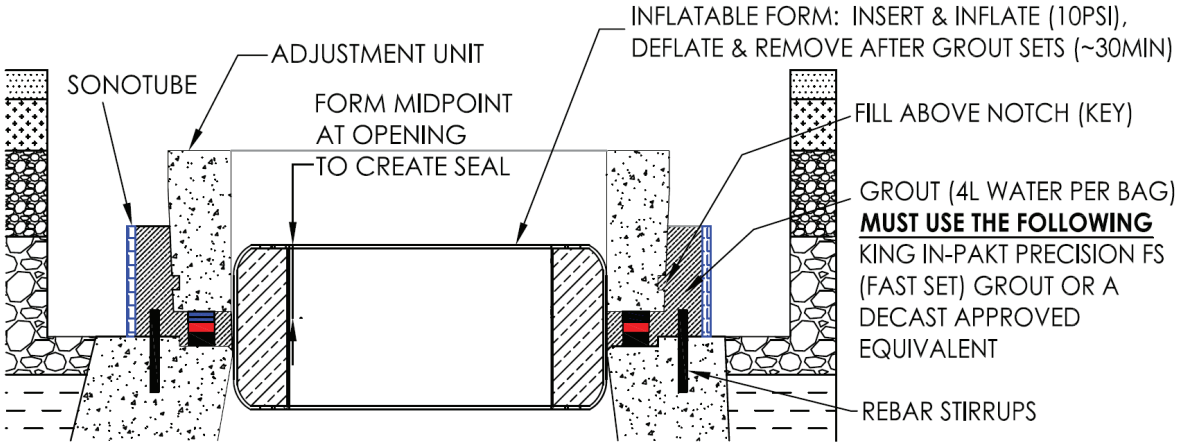
STEP 4: SET CONCRETE ADJUSTMENT UNIT ON SHIMS

- The selected adjustment unit is placed on HDPE shims to be approximately 100mm below the road surface and angled to match the required cross slope



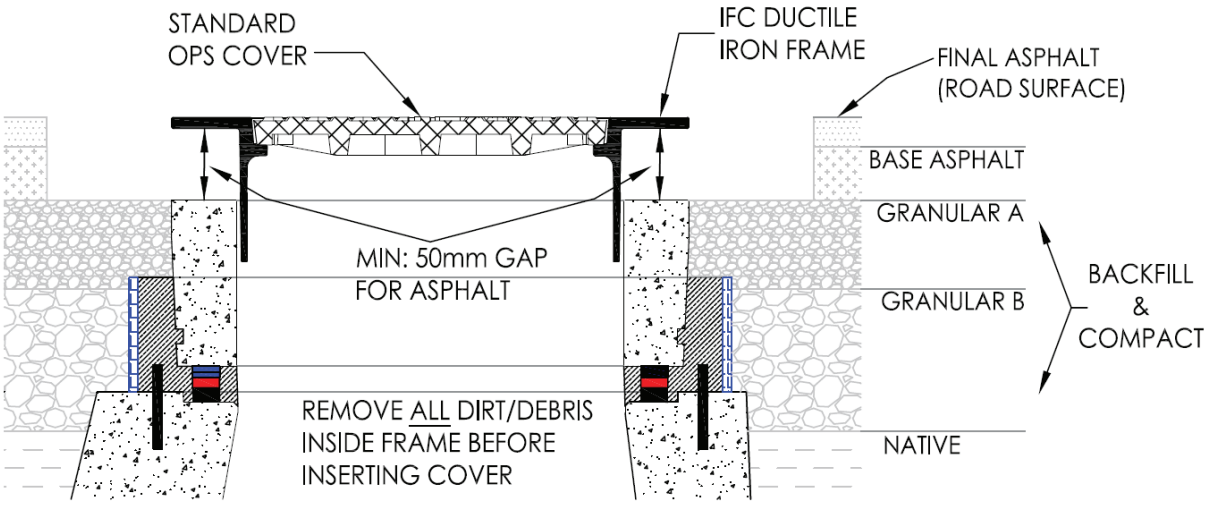
STEP 5: GROUT CONCRETE ADJUSTMENT UNIT

- The inflatable form is inserted and creates a watertight seal to allow grout to be poured on the exterior of the adjustment unit, within the cardboard sonotube, to permanently bond the adjustment unit to the tapered top, flat cap or chamber
- The rebar stirrups provide reinforcement and anchor the structure together



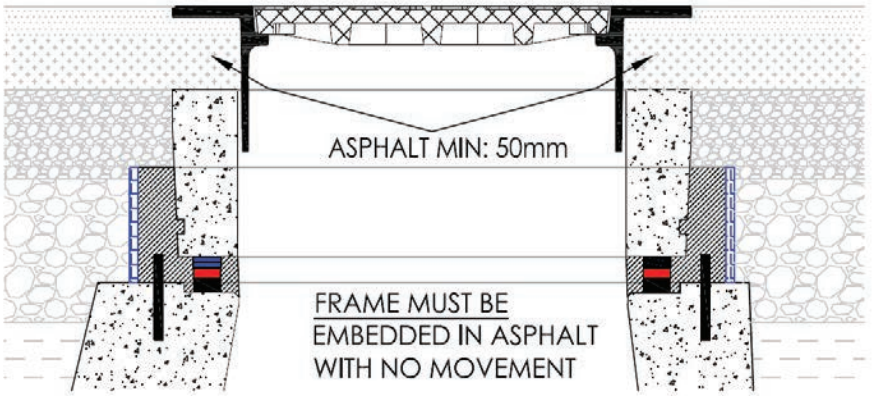
STEP 6: INSTALL IFC-25 FRAME, STANDARD COVER, BACKFILL AND COMPACT

- The telescopic ductile iron frame and standard OPS cover are set into the concrete monolithic structure
- The surrounding road subbase granular material is reinstated up to the top surface of the adjustment unit and compacted



STEP 7: ASPHALT

- Asphalt is compacted between the frame and concrete structure to ensure the frame is cushioned and acts as one unit with the surrounding asphalt
- The asphalt roller compactor drives directly over the frame and cover



1: ASPHALT SPREAD ACROSS EXCAVATED AREA

2: FRAME LIFTED OFF CONCRETE, ASPHALT COMPACTED UNDER FRAME FLANGE

3: ROLLER COMPACTS

TRAINING & CERTIFICATION PROGRAM

FOR CONTRACTORS, MUNICIPALITIES AND CONSULTANTS

All contractors installing IFC-25 MH Systems shall complete the IFC-25 Training & Certification Program, offered free of charge by all distributors. All companies sign off on the training checklist and receive a certificate permitting the company to install the IFC-25 MH System on future projects.

Trainers will not give a passing grade until the contractors prove they can follow the correct process. The current list of approved companies is maintained on the IFC-25 website, www.ifcmhsystem.com. Additionally, all distributors will train and certify inspectors from municipalities and consultants as requested.

IFC-25 TRAINING & CERTIFICATION CHECKLIST

Company: Company XYZ
Representative: Company XYZ Supervisor
Trainer: DECAST Trainer
Date: yyyy.mm.dd

IFC·25

ACTIVITY	TRAINER INITIAL	REPRESENTATIVE INTIAL
BASE ADJUSTMENT		
Setting concrete adjustment units on shims, shim stacks: 25mm MIN, 100mm MAX		
Ensure distance from top of concrete adjustment unit to predicted surface of base asphalt is 70mm MIN		
Ensure concrete adjustment unit is parallel (same slope) with road surface		
Full understanding of the inflatable form and grouting process		
BASE ASPHALT		
Ensure 50mm MIN of asphalt is compacted under the frame flange		
Ensure the frame is embedded in the asphalt with no movement after compaction		
Ensure only asphalt is under the frame flange, ****No shims under the frame flange****		
FINAL ASPHALT		
Ensure distance from top of concrete adjustment unit to predicted surface of base asphalt is 70mm MIN		
Full understanding of the inflatable form and grouting process		
Full understanding of the inflatable form and grouting process		

Representative Signature

Trainer Signature

http://www.ifcmhsystem.com

CERTIFIED PARTNERS

• Accardi Schaeffers • Aecon Group Inc. • Associated Paving & Materials Ltd.
• B&J Construction • Brennan Paving and Construction Ltd.
• Cedar Infrastructure Products • Coco Paving • D. Crupi & Sons Ltd
• DECAST Ltd. • DiCrete Construction Ltd. • Direct Underground Inc.
• Fermar Paving Ltd. • Foggia Construction Ltd.
• Fourwinds Construction Inc. • Furfari Paving Co. Ltd. • Georgian Paving Ltd.
• Graham Bros Construction Ltd. • JC Infrastructure Ltd.
• London Excavators & Trucking Ltd. • Memme Infrastructure Contractors
• M Con • Oak Hill Paving & Concrete • Pachino Construction Co. Ltd.
• RA Crete-Scape Ltd. • Rinker • Sam Rabito Construction Ltd.
• TACC Construction Ltd. • The Miller Group • Thorncrete Construction Ltd.

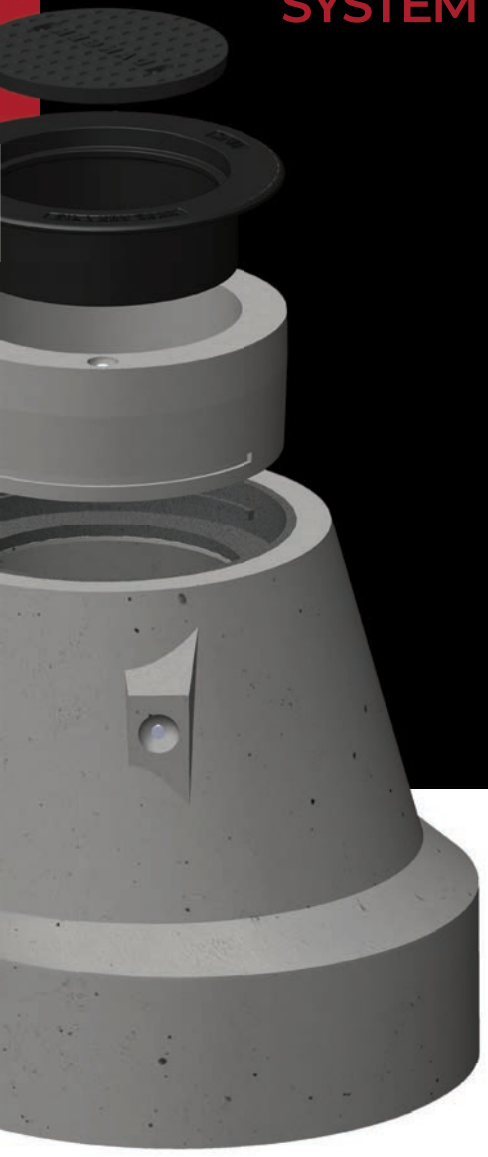
Installation guides (compact sized hardcopies and downloadable electronic versions online) were developed for contractors to have a quick reference for proper installation procedures.

All distributors complete continuous monitoring and inspections of all IFC-25 MH System projects.

The IFC-25 website, www.ifcmhsystem.com, was created to be the central hub for all current IFC-25 material; Installation Video, Brochure, Installation Guides, Certified Contractors & Partners, Manufacturers & Distributors and Contact Information. It is important to note, DECAST has manufacture/distribution license agreements with Cedar Infrastructure Products, OMNI Precast, M CON Products and Rinker Materials to eliminate sole sourcing limitations.

IFC·25

INTEGRATED FRAME & COVER SYSTEM



IFC-25 MAINTENANCE HOLE SYSTEM

A SOLID, ROBUST, IMPENETRABLE MH SYSTEM THAT LASTS MUCH LONGER THAN CONVENTIONAL INSTALLATIONS

APPROVED, SPECIFIED & LICENSED ACROSS ONTARIO

SAVES MILLIONS OF TAXPAYER DOLLARS

ELIMINATES INFLOW & INFILTRATION

MINIMIZES ROAD DETERIORATION, LONGER LIFE-CYCLE

DUCTILE IRON FRAME (270% STRONGER THAN CAST IRON)

PRECAST ADJUSTMENT UNIT (200% STRONGER THAN GRADE RINGS)

QUICK ADJUSTMENTS, LESS TRAFFIC DISRUPTIONS, IMPROVES SAFETY

www.ifcmhsystem.com

DECAST

Tyler Corcoran
705.627.8544
tcorcoran@decastltd.com

8807 County Rd 56 Utopia,
ON L0M 1T0

cedar INFRASTRUCTURE PRODUCTS

Matthew Genovese
905.882.2070
matthew@cedarcip.com

330 Rodinea Rd #1
Maple, ON L6A 4P5

Rinker MATERIALS™

Jessica Steffler
519.622.7574 x 223
jessica.steffler@forterrabp.com

2099 Roseville Road – R.R. #2
Cambridge, ON N1R 5S3

OMNI PRECAST

James Leahey
1-519-632-9112 x 221
info@mconpipe.com

2691 Greenfield Rd
Ayr, ON N0B 1E0

MCON

Mike Paquette
613.229.9545
sales@mconproducts.com

2150 Richardson Side Rd
Carp, ON K0A 1L0

MATERIAL 25 YEAR GUARANTEE

INTEGRATED FRAME & COVER MH SYSTEM

IFC·25

2024.04.15