Traps – Interceptors – Separators - Basins

The followings diagrams are examples and/or samples of traps, interceptors, separators and / or basins for external use only. Point of use / internal traps, interceptors, separators and / or basins must be submitted, reviewed and approved by the Department of Building's current processes. The Sewer Permit Section of the Department of Buildings and the Sewer Design Section of the Department of Water Management have the right to request information, review, approve or inspect any product under Article X, Section 18-29-1000 of the Municipal Code, as well as the right to add or remove any of these samples referenced. All products must be properly selected, sized, installed and operated based upon the manufacture's requirements and as intended to address the specific need.

All traps, interceptors, separators, and/or basins must satisfy Section 18-29, Article 10, Traps, Separators, and Interceptors, Section 11-4, Article 6, Waste Control, of the Municipal Code of the City of Chicago, and in Title 77,Chapter I, Subchapter R, Part 890 ,Section 890.510 Of The Illinois Plumbing Code Grease Interceptor Requirements.

As defined in the Uniform Plumbing Code - Appendix H, Grease Interceptors are designed to control and prevent harmful substances from entering the sanitary drainage system. This worksheet was designed to assist the engineer in choosing the proper grease interceptor.

No. of Meals Per Peak Hour		Waste Flow Rate		Retention Time		Storage Factor		Calculated Liquid Capacity	Grease Interceptor
0.00	x	0	x	0.0	x	1.00	=	0	
Step 1		Step 2		Step 3		Step 4		Step 5	Step 6

1

Number of Meals Per Peak Hour (Recommended Formula):

Seating Capacity ____ x Meal Factor ____ =

Establishment Type	Min Per Meal	Meal Factor
Fast Food	45	1.33
Restaurant	60	1
Leisure Dining	90	0.67
Cafeteria / Hospital	120	0.5

Meals per Peak Hour: 0.00

2

Waste Flow Rate:

Condition	Flow Rate:
With a Dishwashing Machine	6 gallons
Without a Dishwashing Machine	5 gallons
Single Service Kitchen	2 gallons
Waste Disposer Only	1 gallon

Waste Flow Rate:

3

Retention Time:

Type of Kitchen	Time
Commercial Kitchen	2.5 hours
Single Service Kitchen	1.5 hours

Retention Time:

4

Storage Factor

Restaurant Opens	Restaurant Closes		Hours of Operation (8 Hour Min.)
		=	0.00

For Single Service Kitchens, Storage Factor is 1.50

(Midnight is 12:00 AM)

Kitchen Type	Storage Factor:
1. Fully Equipped Commercial	
Hours of Operation	
8 hours	1.00
12 hours	1.50
16 hours	2.00
24 hours	3.00
2. Single Service	1.50

Storage Factor: 1.00

5

Calculated Liquid Capacity:
Multiply the values obtained from steps 1, 2, 3 and 4. The result is the approximate grease interceptor size for this business.

Notes:

6

Select Grease Interceptor:
Using the approximate required liquid capacity from step 5, select appropriate size grease interceptor.

Notes:

THIS WORKSHEET IS INTENDED FOR ESTIMATING THE SIZE OF A GREASE INTERCEPTOR ONLY!

Grease Interceptor Sizing Worksheet

Complete table below and submit with project plans. This worksheet is intended for estimating the size of a grease interceptor only. The final determination for the size of the grease interceptor will be made by the appropriate personnel.

Date		Business	
Address		Calculated by	
Pipe Size (2, 3,4,6)		Flow Rate (GPM)	
Meals/Day		Restaurant type (low/med/high)	
Flatware (yes/no)		Monthly grease production (lbs)	
Grease Interceptor Manufacturer		Model No.	

Pipe Size (Nominal)	Full Pipe Flows	Half Pipe Flows
2	18	9
3	51	26
4	110	55
6	314	157

Flow rates per American Society of Plumbing Engineers (ASPE)

Step 1 -size by flow rate (GPM): select grease interceptor with a rating that is equal to or greater than the half pipe flow of the according drain-line pipe size.

Step 2 -calculate grease production for pump-out cycle: after selecting minimum size grease interceptor by flow rate, calculate the grease production to achieve the target pump-out schedule of at least 1 month and no more than 3 months. Choose grease interceptor that meets or exceeds required grease storage. If exact number of meals is known, calculate with formula; if exact number of meals is unknown, use grease production table below

Meals Per Day	Low Grease Production		Medium Grease Production		High Grease Production	
	Sandwich Shop, Convenience Store, Fresh, Bar, Sushi, Bar, Delicatessen, Snack Bar, Ice Cream Parlor, Hotel, Breakfast Bar, Residential		Coffee House, Pizza, Cafeteria, (no food prep), Japanese, Fast Food, Drive-In, Greek, Indian, Low Grease Output FSE (w/fryer)		Cafeteria, Family Restaurant, Italian, Steak House, Chinese, Bakery/Donut Shop, Buffet, Mexican, Seafood, Barbecue, Fried Chicken, Grocery Store	
	No Flatware 0.005 lbs./meal	With Flatware 0.0065 lbs./meal	No Flatware 0.025 lbs./meal	With Flatware 0.0325 lbs./meal	No Flatware 0.035 lbs./meal	With Flatware 0.0455 lbs./meal
	Grease Lbs. Per Month	Grease Lbs. Per Month	Grease Lbs. Per Month	Grease Lbs. Per Month	Grease Lbs. Per Month	Grease Lbs. Per Month
100	15	20	75	98	105	137
200	30	39	150	195	210	273
300	45	59	225	293	315	410
400	60	78	300	390	420	546
500	75	98	375	488	525	683
750	113	146	563	731	788	1024
1,000	150	195	750	975	1050	1365
1,250	188	244	938	1219	1313	1706

No. of Meals Per Day		Grease :Lbs. /meal		Days/Pump out cycle		Calculated Grease Production
	x		x		=	0
Step 1		Step 2		Step 3		Step 4

Grease Separators
Sizing for Commercial Sinks

BATCH DUMPING PROCESS

The separator should hold one half of the liquid holding capacity of the sink that it services. To determine the cubic holding capacity of the sink, multiply the Length by the Width by the Depth in inches. Divide this figure by 231 to obtain the liquid holding capacity in Gallons. (Example shown is a single compartment sink. Multiply by the number of compartments to get the total holding capacity.) Use this figure in the chart.

Holding Capacity in Gallons Formula:

$$\frac{L" \times W" \times D"}{231}$$

Example:

$$\frac{24" \times 24" \times 20"}{231} = \frac{11{,}520 \text{ cu in}}{231} = 49.87 \text{ Gal}$$

*Low-Inlet models are recommended when a quick opening drain valve is used on the sink waste, resulting in a low waste outlet from the sink. Use a Low-Inlet model when there is not sufficient room next to the sink, or when it is necessary to place the separator underneath the sink drainboard. On larger model separators, we recommend a flush-with-floor installation in concrete floor construction. For installations in or on the floor below, use the next larger size separator.

Example:
Type of Fixture: 2-Compartment Commercial Sink
Maximum Holding Capacity of Fixture: 30 gallons
Liquid Holding Capacity and Seal of Separator: 17 gallons

Example:
Number of Fixtures: 3-5
Maximum Holding Capacity of Fixture: 110 gallons
Liquid Holding Capacity and Seal of Separator: 60 gallons

Location: Floor below fixtures

COMMERCIAL FOOD WASTE GRINDER

A grinder with a 1/2 h.p. motor requires a separator with a minimum holding capacity of 50 gallons. This is for a small installation in a restaurant with a seating capacity up to 100 people. For larger grinders with higher h.p. ratings, each additional 1/2 h.p. requires an increase of 20 gallons to the separator. Thus, a 1 h.p. grinder requires a 70 gallon holding capacity, a 1 1/2 h.p. grinder requires a 90 gallon holding capacity, and so on

.

DISHWASHER

Select a separator with a holding capacity equal to one hour's water consumption. On a dishwasher with three tanks, bypass the final rinse when permitted by code. If the rinse water bypasses the separator, the liquid holding capacity of the separator shall be equal to or greater than the total liquid holding capacity of the dishwasher

Grease Interceptors

General Information

Interceptors are mainly used for one product. There are grease interceptors, solids interceptors, hair interceptors, lint interceptors, etc....but each unit can only be used for its intended purpose. In some cases, a combination of two units is required. Example: A solids interceptor should be used in front of a grease interceptor. All interceptors require an external flow control in front of it. Some will have a restrictor on the inlet of the interceptor and call it a built-in flow control. It is still on the front end of the interceptor and does not allow the waste to enter the interceptor unobstructed.

HOW TO CLEAN THE INTERCEPTOR

For a passive grease interceptor to perform as designed, a strict maintenance schedule must be followed. If adequate maintenance is not performed, excessive grease buildup will occur until water, laden with grease, passes directly through the unit. Therefore, no matter how efficient the design or how proper the installation, these units perform only as well as the maintenance routine allows.

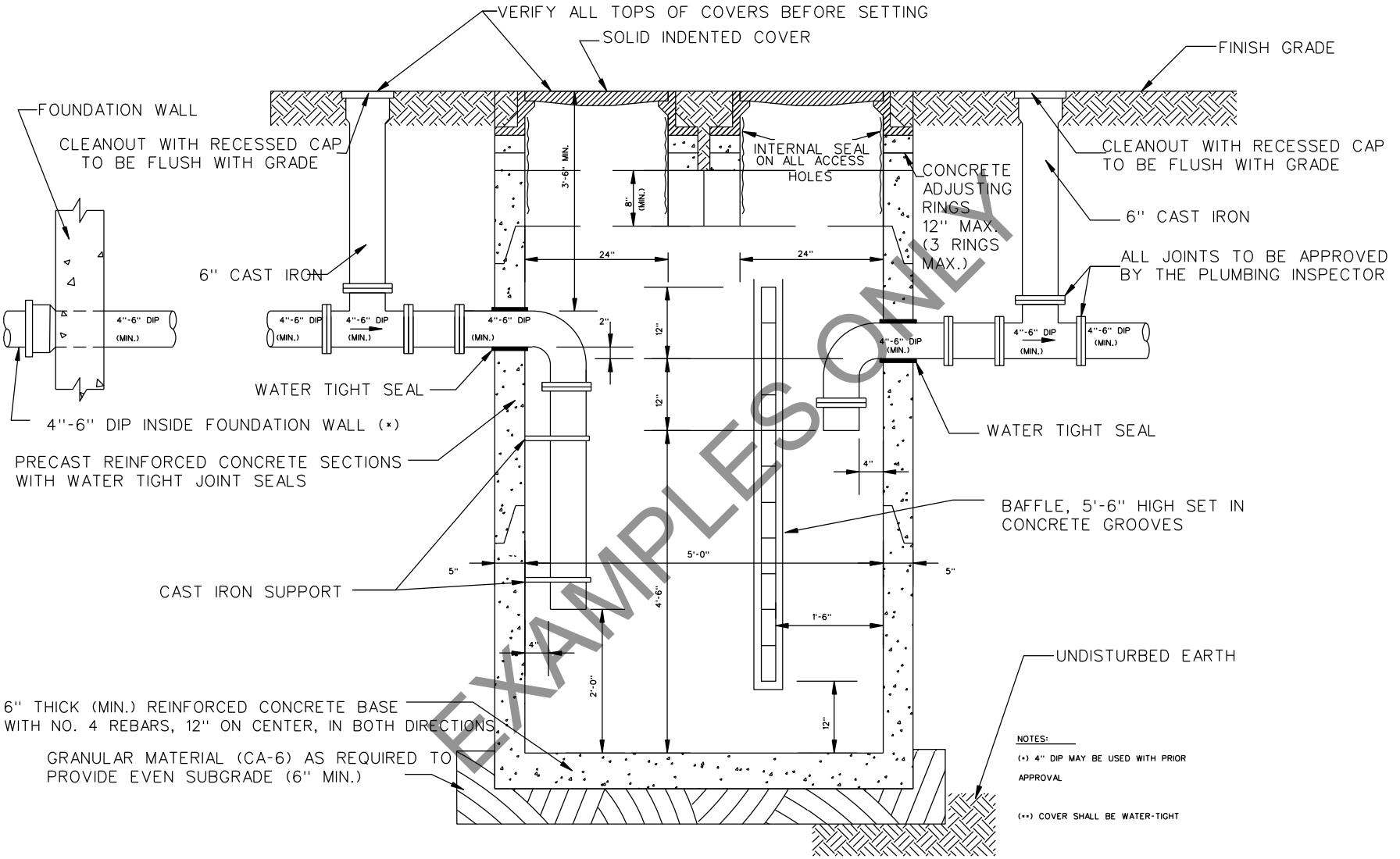
Cleaning and Maintenance Instructions should accompany every interceptor. It is a good practice to have a copy of the cleaning instructions located near the interceptor, directing the user on the proper operation/cleaning methods.

1. Remove floating grease.
2. Remove solids from the bottom of the unit.
3. Inspect gasket for damage and replace if necessary.
4. Replace cover and secure cover tightly.
5. Grease and other waste matter that has been removed from the interceptor should not be introduced into any drain, sewer, or natural body of water. This waste matter should be placed in proper containers for disposal.

Note: Cover gaskets are necessary to seal against gases and to prevent overflows. They must be heavy and elastic enough to give easy sealing.

Interceptors are not pressure vessels. Covers should be easily removable. When an interceptor is set in the floor, stainless steel bolts should be used (brass bolts are too easily stripped; steel bolts become rust locked). NOTE: Interceptors not easily opened for cleaning will not be cleaned regularly.

Many products are sold as aids to seemingly clean grease interceptors. These include acids and caustics with known hazards in handling, or so-called "miracle enzymes" with limited conditions and special instructions. These type of products are NOT RECOMMENDED because of the damage they can do to the interceptor, as well as the fact that the interceptor catches the grease at the point of use to be disposed, and not to give the user a vessel to add chemicals into the waste stream.



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EXAMPLE ONLY

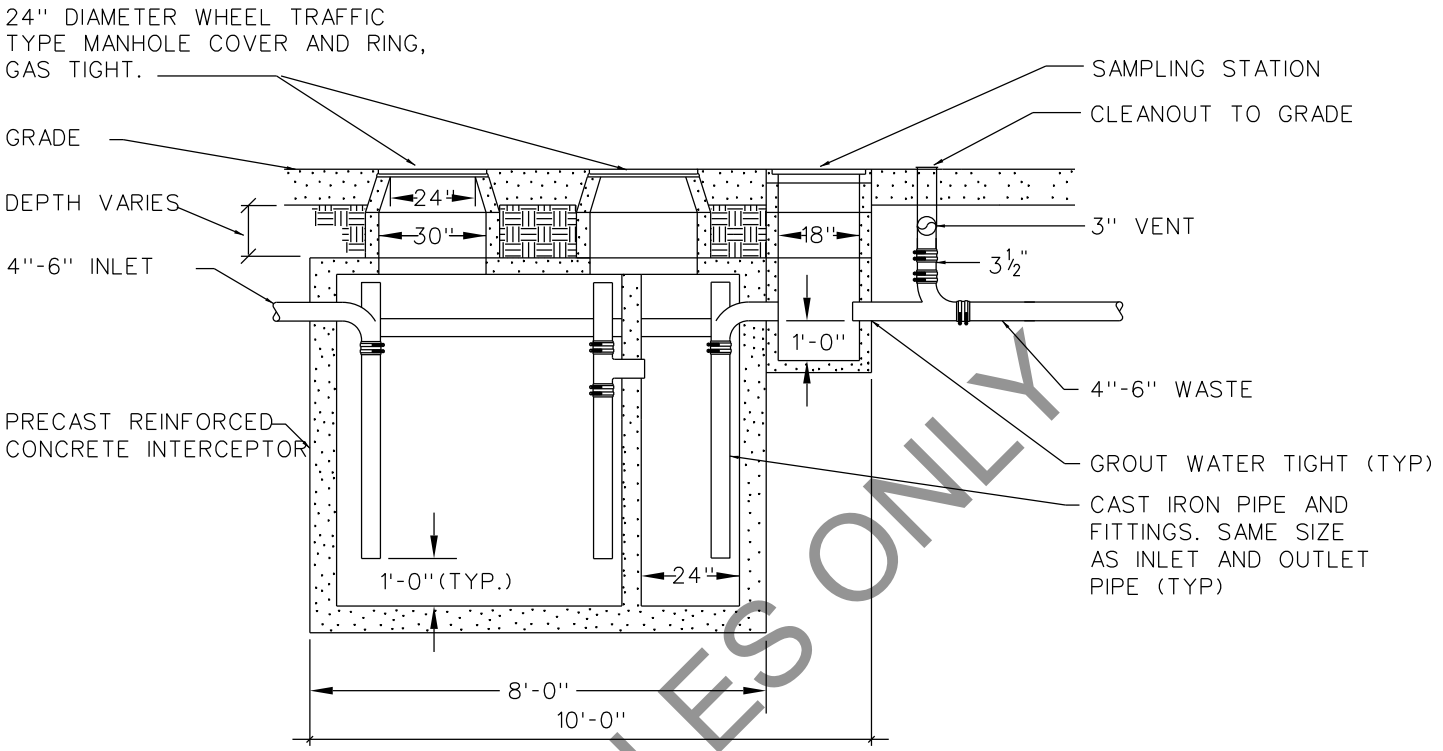
REVISIONS	
DATE	DESCRIPTION
2/15/14	Revised

CITY OF CHICAGO
DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

Grease Basin Standard

SCALE: AS SHOWN

A.100.6



GREASE INTERCEPTOR DETAIL

NO SCALE

Notes:

This detail is applicable to 2 criteria:
1. Apartment buildings, 13-39 units
2. Fast food Establishments

For apartment buildings with 7-12 units, grease basin size is 3 feet by 6 feet.

This detail serves as a guide only. Developers/owners must submit product and/or materialspecifications and details from localmanufacturers/suppliers for review and approval by Department of Buildings and Department of Water Management.

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CHECKED BY: GD, GC, SO

REVISIONS	
DATE	DESCRIPTION
2/18/14	Final

CITY OF CHICAGO
DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

Large Capacity Grease Interceptor

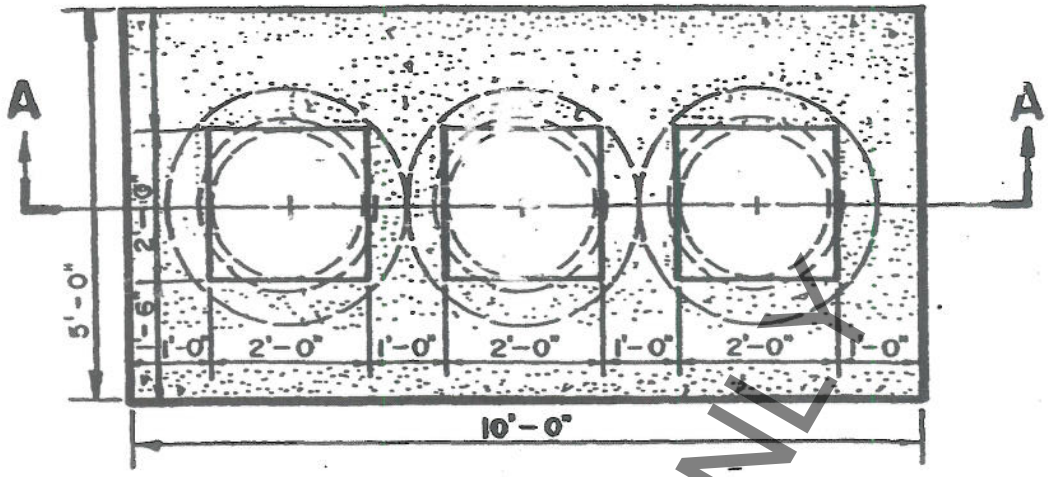
SCALE: AS SHOWN

A.100.7

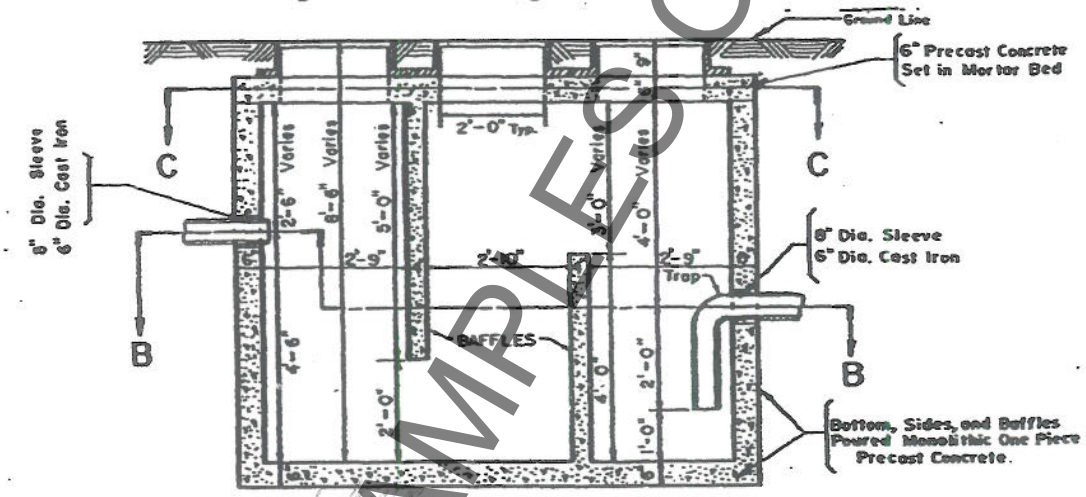
EXAMPLE ONLY

GREASE SEPARATOR

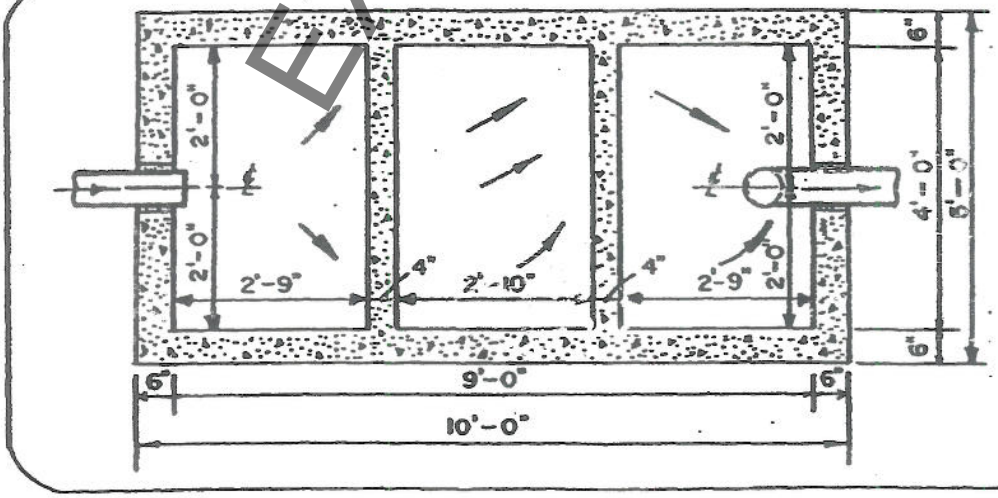
PLAN and SECTION - CC



For Restaurants Units other than Fast Food Establishments or Apartment Building 40 Units and Over.

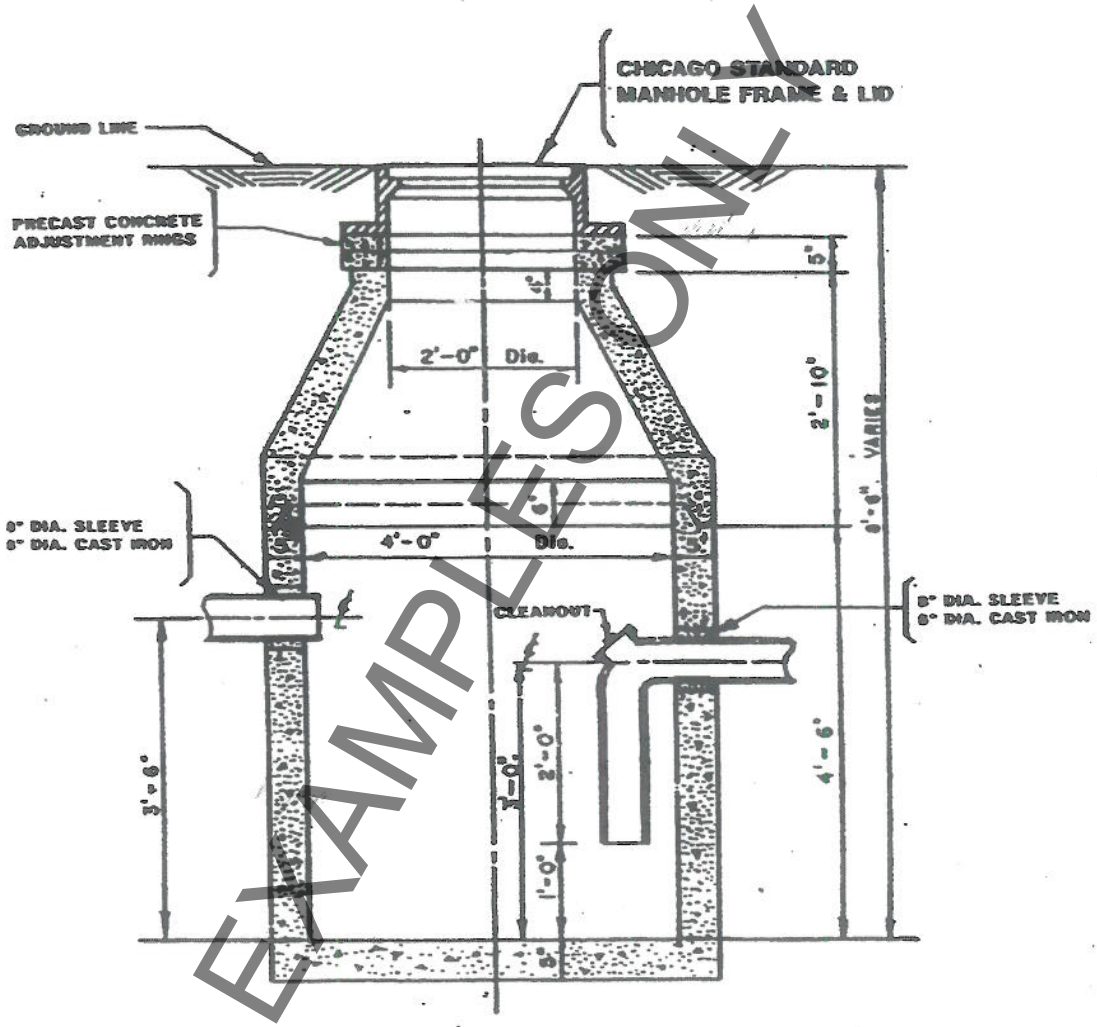


SECTION - BB



PRECAST GREASE BASIN

FOR APARTMENT BUILDINGS 13 TO 39 UNITS OR FAST FOOD ESTABLISHMENTS.



GREASE BASINS MUST BE VENTED WHEN CONSTRUCTED INSIDE BUILDINGS.

NOTE:

FOR APARTMENT BUILDINGS WITH 7 TO 12 UNITS, A GREASE BASIN 3 FEET BY 6 FEET IS REQUIRED.

Sand / Oil Interceptor Sizing Worksheet

Business Name: _____ Date: _____

Address: _____

City, State, Zip: _____ Calculated By: _____

To calculate the required volume, complete the highlighted boxes

Step 1

Size of Facility

Facility Size (Square Feet)
1

Square Footage
1

Step 2

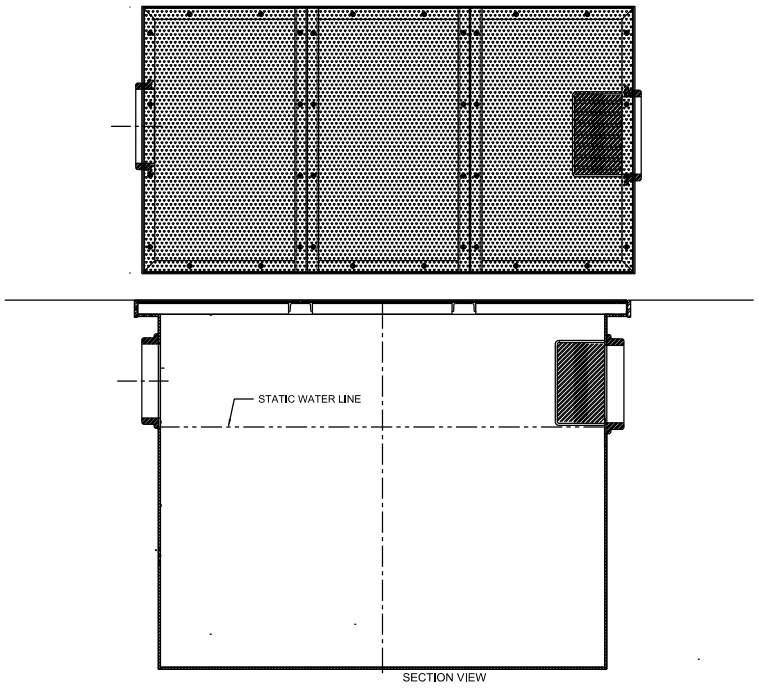
Facility Type

1	Truck Washes, Heavy Equipment Wash
2	Automatic Car Wash
3	Car Wash (Hand Held)
4	Machine Shop, Work Area, & Automotive Workshop
5	Paint Spray Booths
6	Printer
7	Parking Garage (where floors are to be washed)
8	Parking Garage (where tenant cars are to be washed)
9	Parking Garage (No Water, Fire Sprinklers Only)

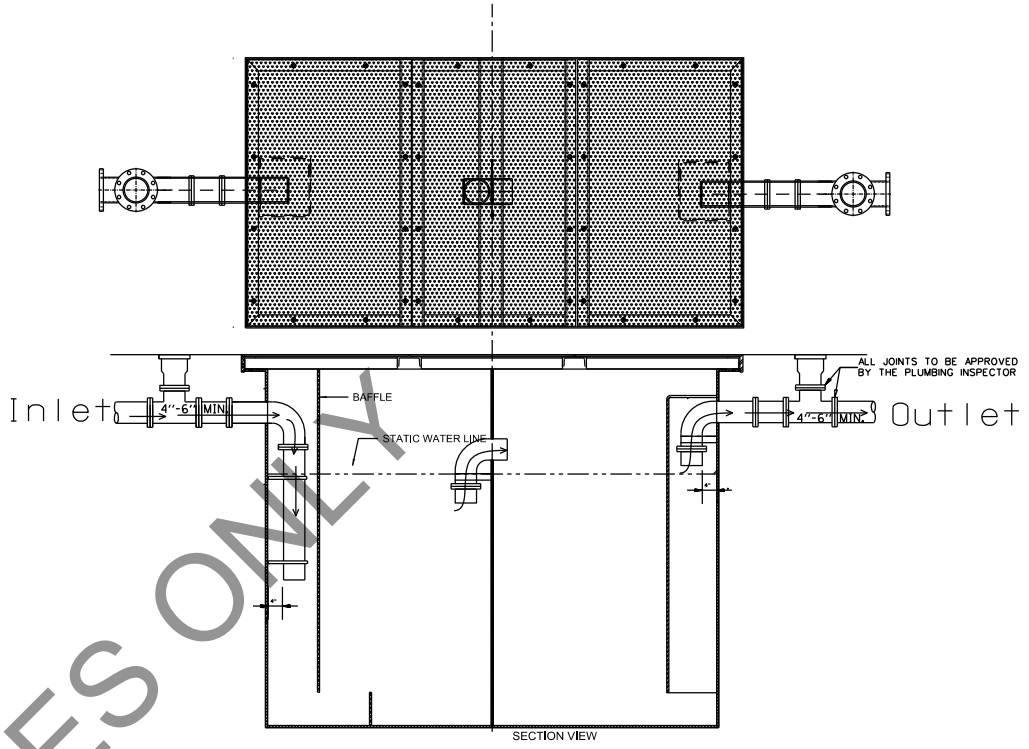
Facility Type
1

Facility Size		Facility Factor		Conversion Factor		Storage Factor	=	Calculated Liquid Volume	Sand - Oil Interceptor Size (Gal.)
1	x	0.0667	x	7.48	x	2.0	=	1	0
Step 1		Step 2		Step 3		Step 4			

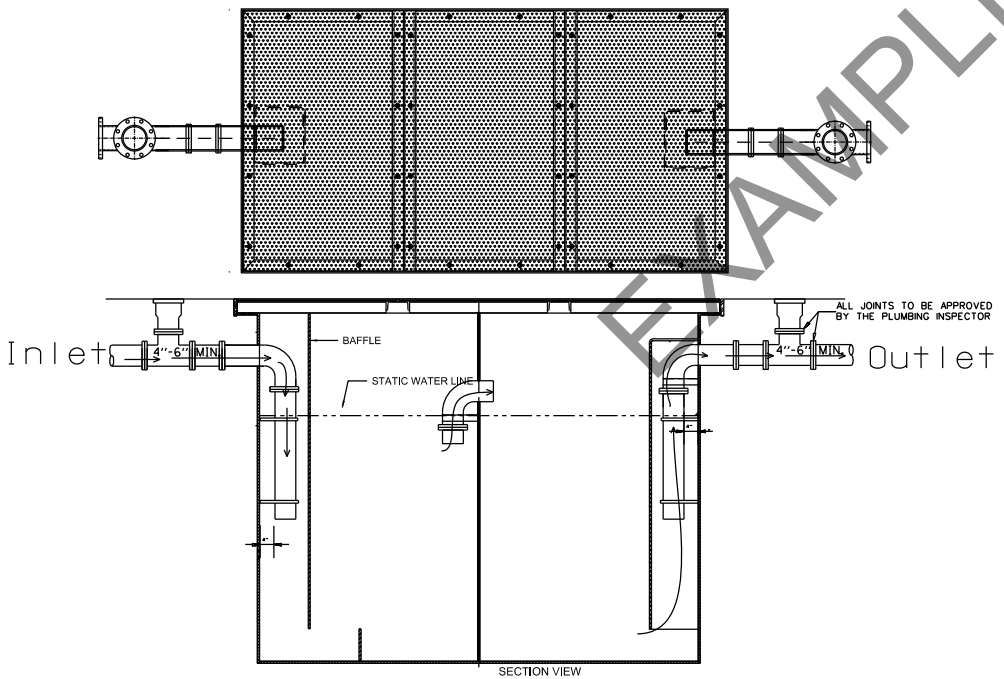
Facility Use	Sq. Ft.
Truck and Heavy Equipment	15
Automatic Car Washes	50
Car Wash (hand-held spray)	75
Machine Shop / Work Area /	100
Paint Spray Booth	250
Printers	300
Parking Garages (floors are to be	2,000
Parking Garages (tenant cars are to	3,000
Parking Garages (no water outlets	4,000



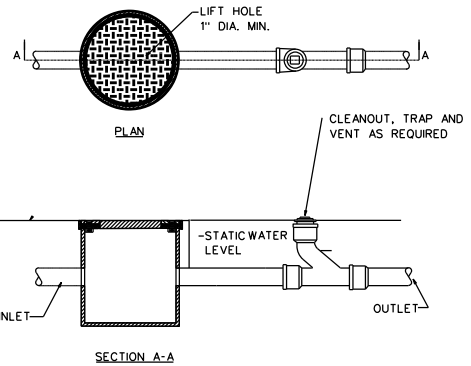
NonBaffled Grease-Oil Trap/Interceptor



Baffled Grease-Oil Trap



Baffled Grease Interceptor



Optional SAMPLING BOX

NO SCALE

EXAMPLE ONLY

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DATE	DESCRIPTION
2/18/14	Final

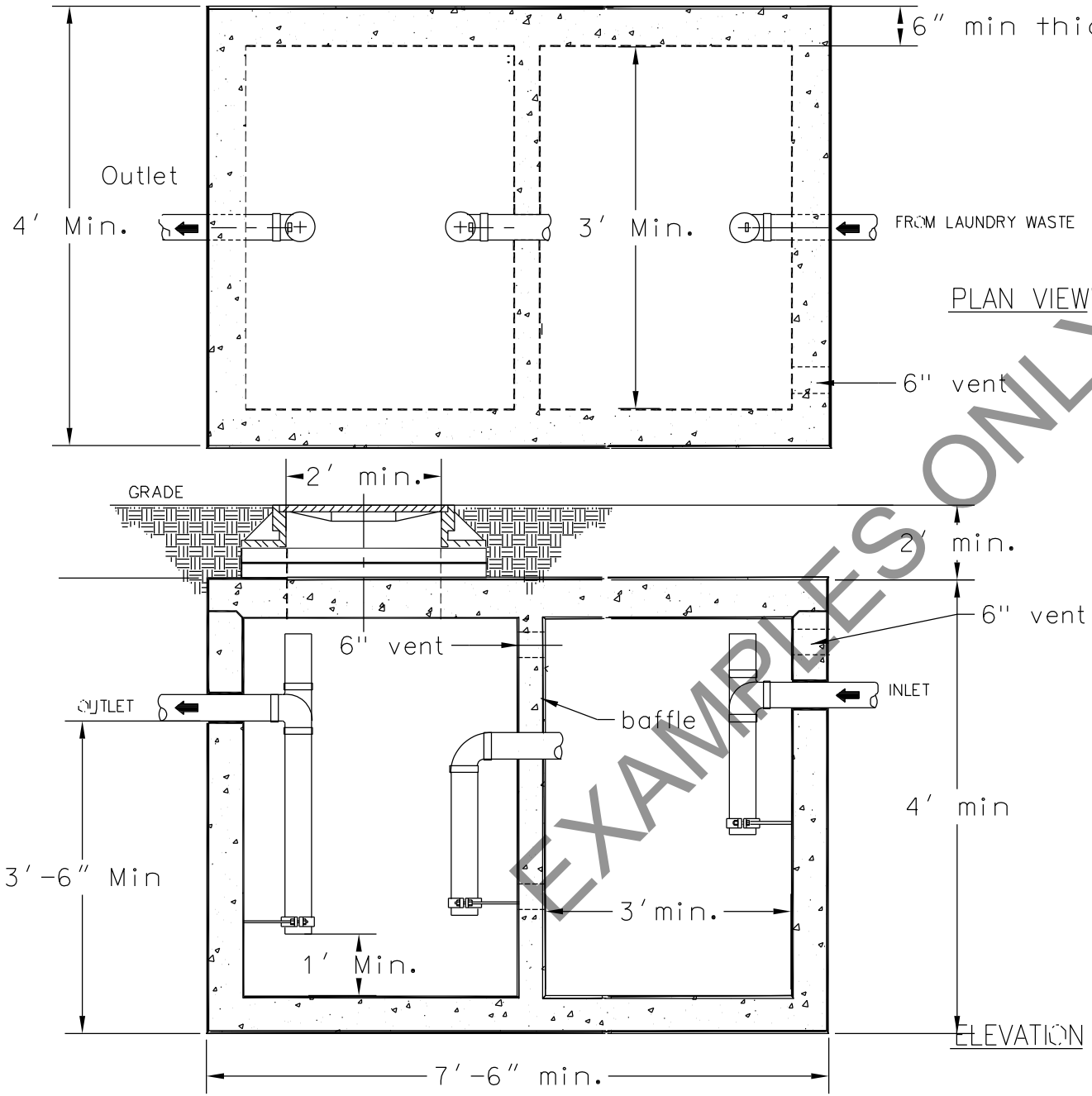
CITY OF CHICAGO
DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

Oil/Grease Trap/Interceptor

SCALE: AS SHOWN

A.102.2

Lint Interceptor Sizing Calculator for Gravity Drain Laundry Machines	
Number of Machines	5
Average Gravity Discharge Rate per Machine (GPM)*	12.5
Average Wash Cycle (hours)*	0.7
Average Operating Hours (hours)*	16
Average Turns Per Day Per Machine*	5.5
Simultaneous Use Probability	**75.0%**
Maximum Drain Load to Interceptor (GPM)	**47 GPM**
* All Data for constants provided by Alliance Laundry Systems (www.unimac.com) or the Coin operated Laundry Association (www.coinlaundry.com)	
Alternate Lint Interceptor Sizing calculator	
Total Gallons Per Cycle	
Cycles per hour	
Retention time	
Storage factor (based on hours of Operation)	
Size of Lint Interceptor in Gallons	**0**
Storage Factors	
Laundry Type	*Factor*
Institutional Laundry	2.5
Standard Commercial Laundry	2.0
Light Commercial Laundry	1.5



Lint basin criteria:

No. of Washing Machines	No./size of basins
1-15 units	1, 3'x6'
16-30 units	1, 4'x8'
31-45 units	2, 1 of each size above
46-60 units	2, 4'x8'

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EXAMPLE ONLY

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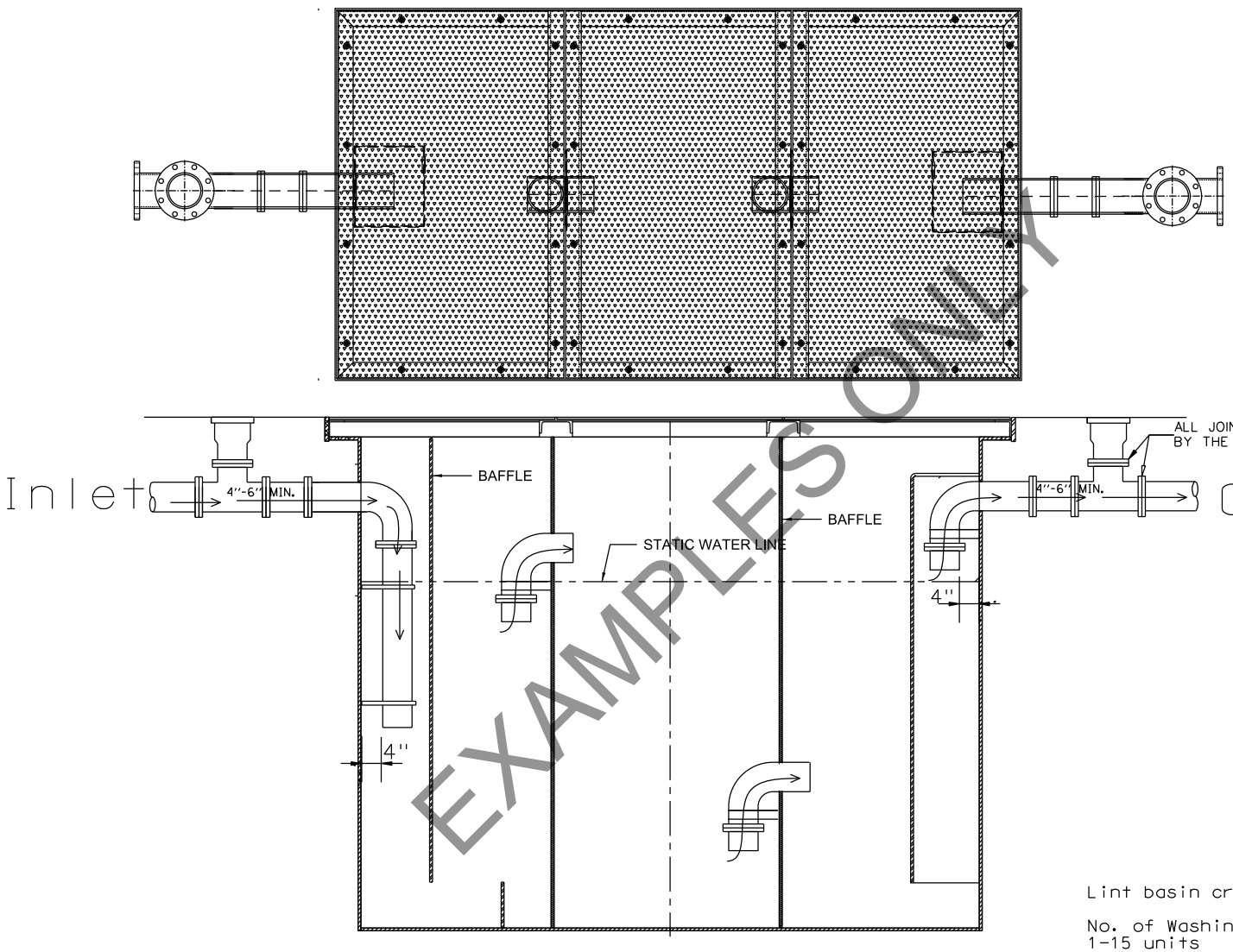
CITY OF CHICAGO
DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

Lint Basin Standard

SCALE: AS SHOWN

A.102.4



Lint basin criteria:

No. of Washing Machines	No./size of basins
1-15 units	1, 3'x6'
16-30 units	1, 4'x8'
31-45 units	2, 1 of each size above
46-60 units	2, 4'x8'

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DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

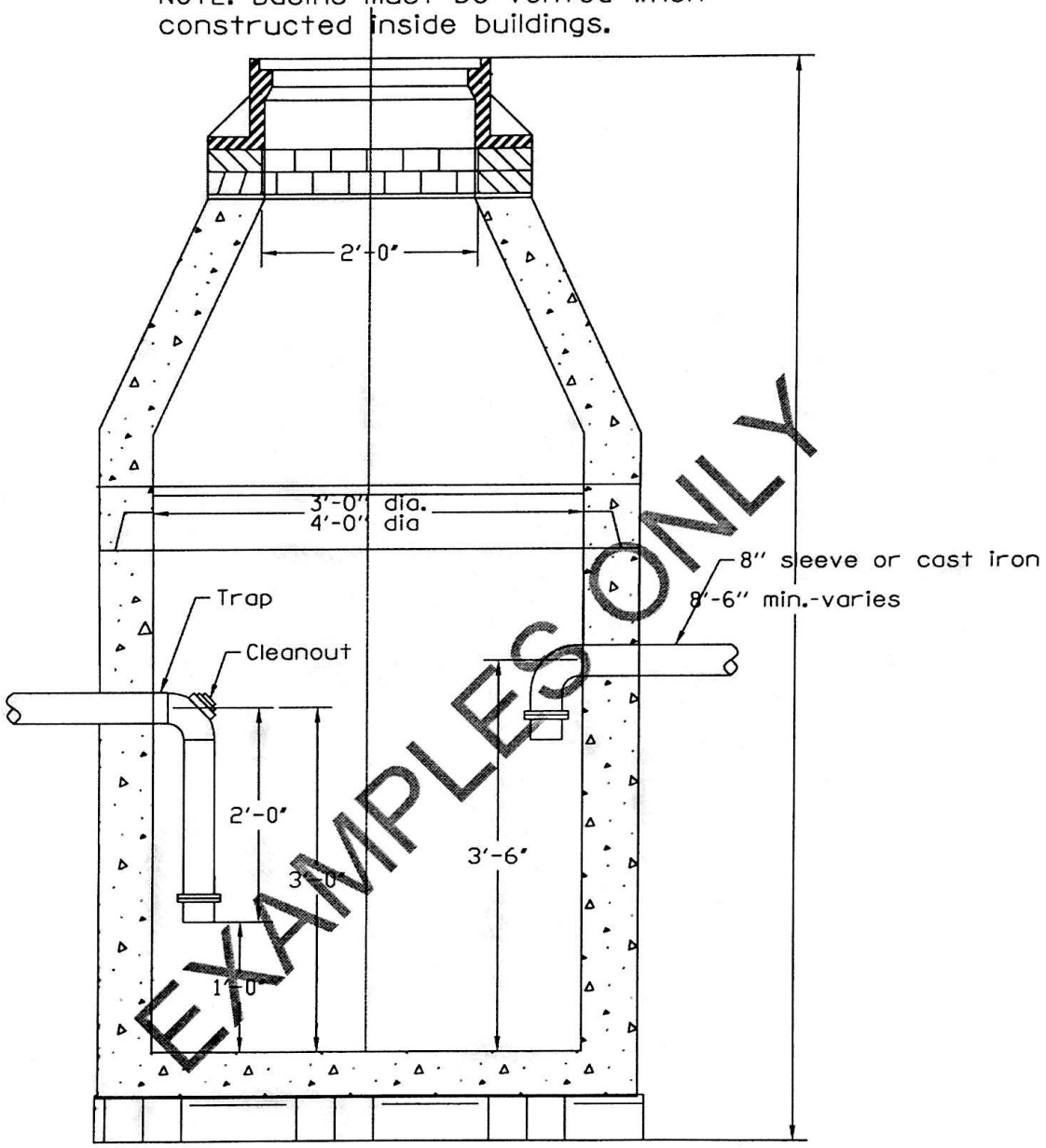
Lint Basin Standard

SCALE: AS SHOWN

A.102.5

Precast Grease/Lint Basin

NOTE: Basins must be vented when constructed inside buildings.



Grease basin requirements:
1. Apt. buildings 13-39 units and fast food establishments, use 4' basin.
2. Apt buildings 7-12 units, use 3'x 6' basin

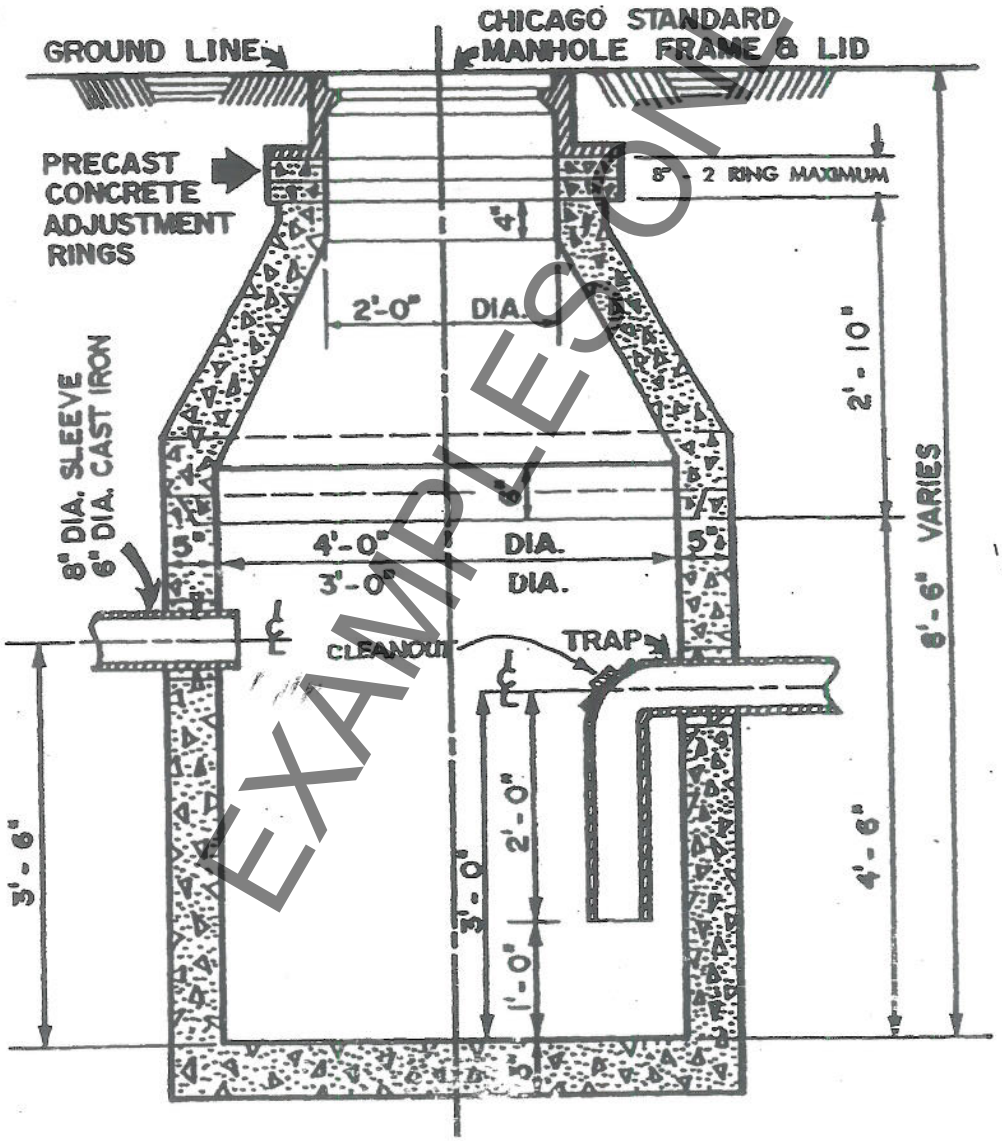
Lint Basin Requirements:

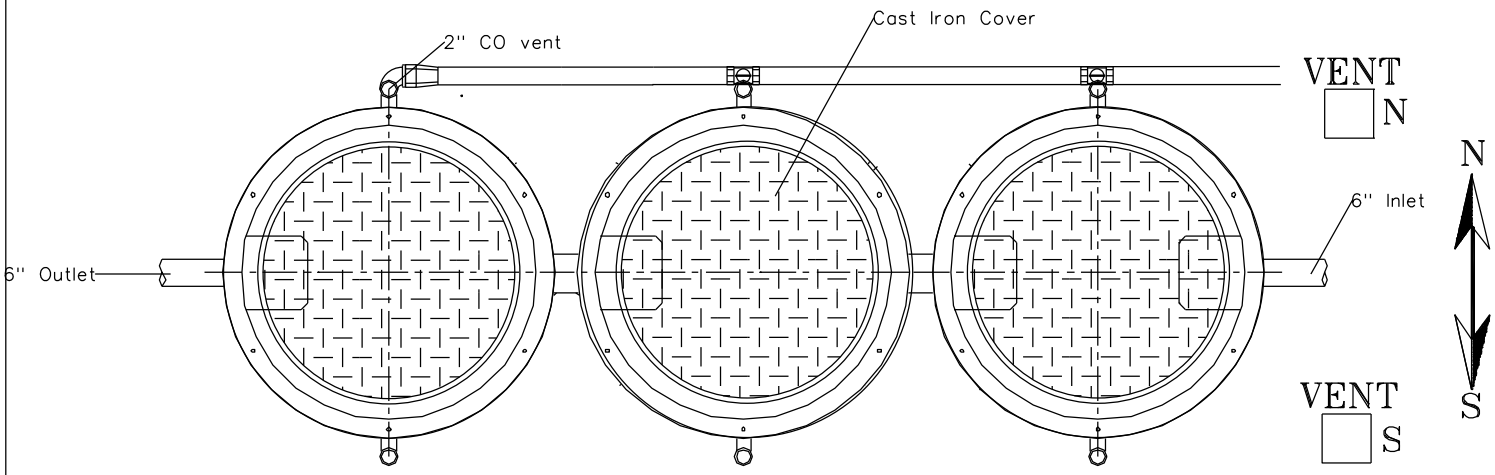
No. of Washing Machines	Qty & Size of basins
1-15 units	1 basin, 3'x6'
16-30 units	1 basin, 4'x8'
31-45 units	2 basins, 1 each 3'x6' & 4'x 8'
46-60 units	2 basins, 4'x8'

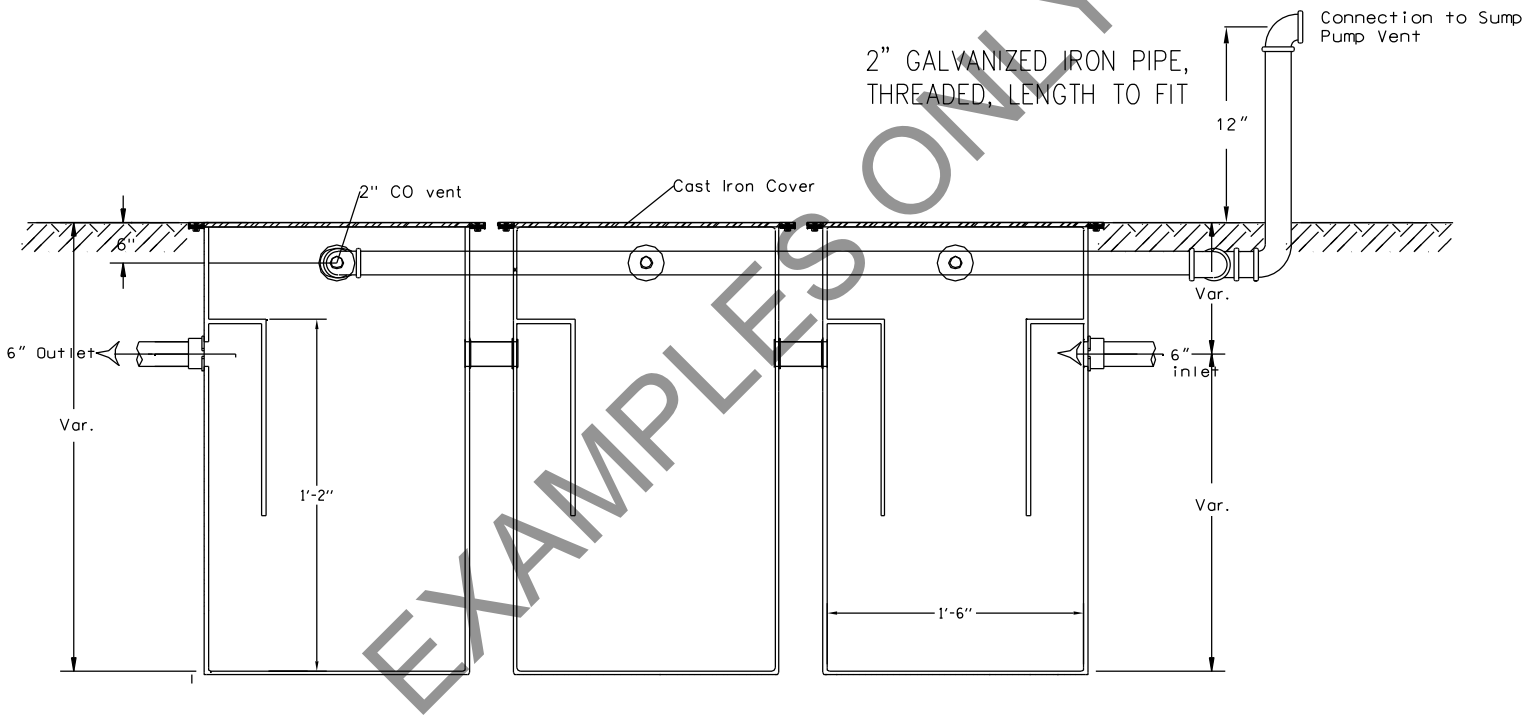
AMOUNT OF WASHING MACHINES	REQUIREMENT, AMOUNT & SIZE
One to 15 Units	1 — 3' X 6'
16 to 30 Units	1 — 4' X 8'
31 to 45 Units	2: 1, 3' X 6' and 1, 4' X 8'
46 to 60 Units	2 — 4' X 8'

PRECAST LINT BASIN

Lint Basin must be vented when constructed inside building.







Notes:

1. Minimum diameter of each basin must be 1'-6".
2. Bottom of each basin must be 1'-2" below invert of outlet/inlet of all basins.
3. Inlets and outlets must be 6" minimum.
4. Vent connections must be 2" minimum.
5. All basin covers must be cast iron, air-tight, and boltable/lockable.

Material and/or product specification sheets must be submitted with Sewer Permit application for approval.

EXAMPLE ONLY

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CITY OF CHICAGO
DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

Triple Garage Basin

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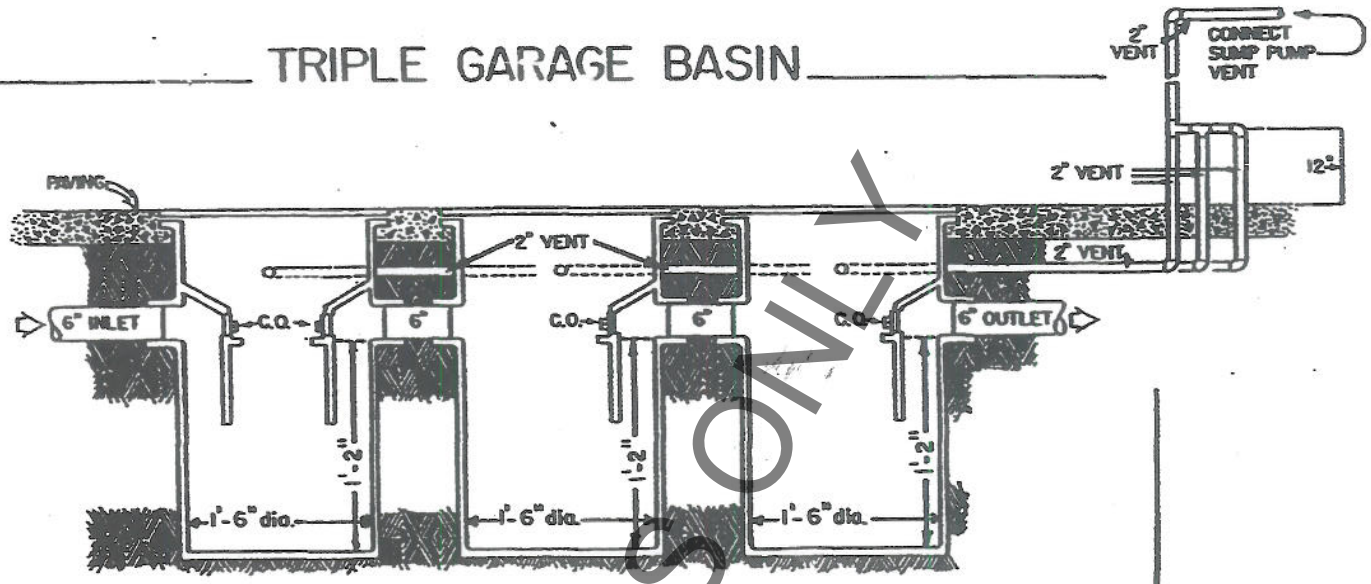
SCALE: AS SHOWN

A.103.1

TRIPLE GARAGE BASIN



NOTE:

Bottom of Basin shall be 1'-2" below invert of outlet.
Neenah 18" Cast Iron Triple Garage Basins.
6" Inlets and Outlets.
2" Vent connections.
Cast Iron gas-tight bolted covers.
Depths of Basins as required by Inlet & Outlet elevation.
See plan for Invert Elevation.

CITY OF CHICAGO
Department of Water Management

DRAINLAYER'S LICENSE CLASSIFICATIONS:

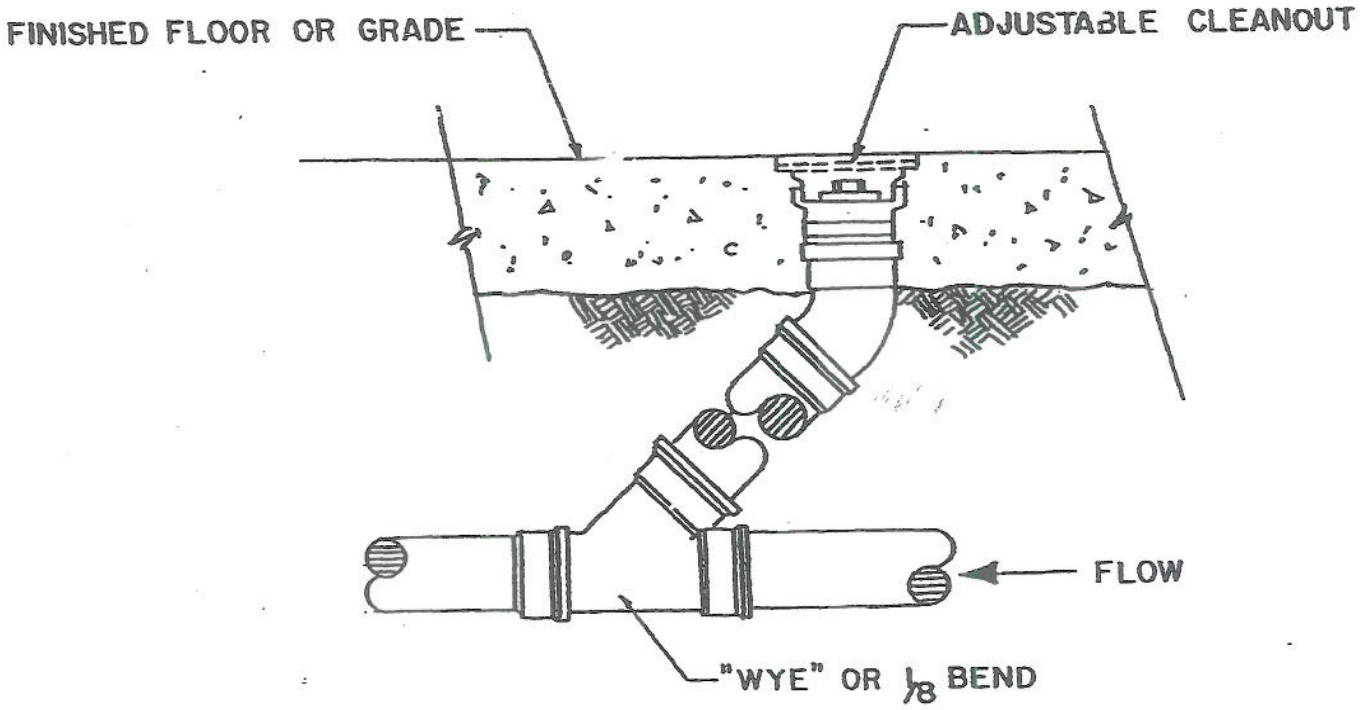
During 2002, the Department of Water Management implemented a DRAINLAYER'S TRAINING PROGRAM in conjunction with licensing. This program will be offered by City Colleges of Chicago in 2006 again. Successful completion of this program, including passing both a written and practical exam is required in order to obtain a drainlayer's license from the City of Chicago for 2006. All current license holders should have completed this program from January 7, 2005 through November 18, 2005. If not, please see the 2006 Program Schedule attached.

Work included under an "A" drainlayers license
New building construction, sewer main construction, or sewer and sewer related activity is done. All license requirements are needed including C.D.O.T. license, practical and written test every five years.
New construction on private property
New construction in the public way
Single family residences
Development of townhouses - condominiums - multiple family residences
Also, all items included under a type "B" and "C" license

Work included under a "B" drainlayers license
Repairs and construction on existing buildings only, or sewer and sewer related activity is done. No new building construction or new sewer main construction activity is done. Otherwise, all license requirements are needed including practical and written test every five years except C.D.O.T. permit needed only as applicable.
Repairs - Repair extensions
Repair or adjustment of a sewer structure in public way or private property
Flood controls, overhead conversions, sump and drain tile pipe
Flood control repair
Sump pump without overhead conversion/drain tile pipe
Stubs permits
Power rodding
Inspection manhole
Paving
Also, all items included under a type "C" license

Work included under a "C" drainlayers license
Only sewer and sewer related activity is done. No building construction or sewer main construction activity is done. Requirements start on page 13 of the 2006 Permit and Fees Booklet are needed including practical and written test every five years.
Pumping permit for miscellaneous other
Pumping water out of basements
Seal permits
Televising, cleaning, lining and inspection of sewers
Installation of testing equipment

Please be advised a type "A" license encompasses the activity listed under a type "B" and a type "C" license, and likewise a type "B" license encompasses the activity listed under a type "C" license. Drainlayers ARE NOT ALLOWED to make REPAIRS and/or ADDITIONS in the PUBLIC WAY unless it is for commercial/industrial or a building with more than four units.



TYPICAL CLEANOUT TO FINISHED FLOOR

NOT TO SCALE

Note: May be used for pipe sizes smaller than 12" in diameter to segment pipe lengths exceeding 150 feet.

STORM SEWER OUTFALL
ASSOCIATED WITH

{Insert Property Street Address}

IF YOU SEE
DISCHARGE DURING
DRY WEATHER
CALL

{Insert Property Owner's Phone Number}

PRIVATE STORM OUTFALL SIGN ON WATERWAYS

Operation and Maintenance Plan Owner's Certification Statement

Property Name: _____

Property Address: _____

As the owner(s) of the subject property, by signing this document, I/we acknowledge that I/we have received and reviewed the Operation and Maintenance Plan, dated _____, and understand its contents. (as required by the Stormwater Management Ordinance, Section 11-18-030).

In the event that I/we were to sell this property, I/we agree to give a copy of the Plan to the new owner(s) and this Owner's Certification Statement for signature. This signed Certification Statement must be submitted to the City's Department of Buildings upon transfer of ownership.

I/we further agree to adhere to the maintenance schedule of best management practices stipulated in the Plan. I/we also acknowledge that if I/we don't maintain the measures as shown in the Plan, upon City inspection, I/we could be liable for a violation of the City's Municipal Code (according to Stormwater Management Ordinance Section 11-18-130).

_____
Initial Owner(s) Printed Name

_____ _____ _____
Initial Owner(s) Signature Date Notary Public

_____
2nd Owner(s) Printed Name

_____ _____ _____
2nd Owner(s) Signature Date Notary Public

_____
3rd Owner(s) Printed Name

_____ _____ _____
3rd Owner(s) Signature Date Notary Public

CITY OF CHICAGO
Department of Water Management

RIGHT OF WAY AS-BUILTS - RECORD DRAWINGS FORM

The contractor will be required to submit "as built plans" / record drawings of all new sewers and sewer structures that will be owned and maintained by the City. These "as-built plans" / record drawings should be sealed by a registered land surveyor and/or a registered professional engineer and **submitted within 30 days after the completion of the sewer work.** These "as-built plans" / record drawings should be forwarded to the Department of Water Management, Bureau of Engineering Services, Sewer Design Section located at 1000 East Ohio Street, Elevation +51, Room 313, Chicago, Illinois 60611 along with a copy of this form, the coinciding sewer permit and video tape, as applicable.

Drainlayer's Name: _____ Phone No.:

Drainlayer's Signature:

Date of Project Completion:

Date Submitted As-Built Plan / Record Drawing:

FOR OFFICE USE ONLY:

Project Manager: _____ Phone No.:

Project Name:

Project No. and/or Contract No.:
(i.e., CDOT, IDOT, COUNTY)

Project Location:

Issues By: _____ Date: