APPENDIX N:
SANTA CLARITA VALLEY WATER AGENCY
TECHNICAL MEMORANDUM

CIVILTEC
engineering inc.
Civil, Water, Wastewater, Drainage and Transportation Engineering
Construction Management ● Surveying
California ● Arizona

October 23, 2020

Santa Clarita Valley Water Agency
26521 Summit Circle
Santa Clarita, CA 91380-9003

Attention: Brent Payne, PE, Principal Engineer

Subject: Hydraulic Analysis for Tract No. 83087 MetroWalk Development
Technical Memorandum Work No. S21-600

Dear Mr. Payne:

CIVILTEC engineering, inc. (***Civiltec***) prepared a hydraulic assessment of the proposed MetroWalk development in the City of Santa Clarita, California. The project is being proposed by New Urban West, Inc.; Alliance Land Planning & Engineering, Inc. is the developer's engineer. The project will include 498 units, consisting of 348 apartments (PA-1, PA-2, and PA-3) on the west side of the site, and 150 residential townhome units (PA-4) on the east side of the site. The proposed development is a private community just south of Harriman Drive and east of Lost Canyon Road. This development will tie into the existing Santa Clarita Valley Water Agency (SCV Water) water distribution system via a 12-inch main on Harriman Drive. Two 12-inch laterals will be installed from the SCV Water system to the onsite private fire and domestic system. These two laterals will be master metered with backflow prevention.

This Technical Memorandum includes a project description, an estimate of the demand associated with the project, a hydraulic analysis to assess system impacts and to develop basis for design, concept designs of new infrastructure that meets the SCV Water design criteria as required, and an offsite cost estimate associated with implementation of the design.

Table 1 summaries the estimated costs of new water infrastructure. This information is also summarized in the Cost Summary section of this Technical Memorandum and provided as an itemized breakdown in **Exhibit A**.

Table 1 – Cost Summary

Category	Costs
Onsite Costs	Not Applicable
Offsite Costs	$209,625
Facility Capacity Fees	$1,391,149
Total Costs	**$1,600,774**

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PROJECT DESCRIPTION

The MetroWalk development is on approximately 20.4 acres in the Santa Clarita Valley east of the Highway 5 Freeway, and south of Highway 14 (Antelope Valley Freeway) in the City of Santa Clarita, California. New Urban West, Inc. proposes to develop 498 units, consisting of 348 apartments (PA-1, PA-2, and PA-3) on the west side of the site, and 150 residential townhome units (PA-4) on the east side of the site. **Table 2** displays the sizes per land usage in the development. The community will consist of 12-inch pipelines for the onsite private water system. The project will also utilize fourteen (14) private 6-inch fire hydrants inside the community and four (4) existing fire hydrants offsite. **Exhibit B** includes the proposed Concept Master Plan (3/24/20), and the Fire Access/Hydrant Plan (LACFD approved 9/3/20).

Table 2 – Land Use

Land Use	Acres
Multi-Family - Townhomes/ Condos	5.59
Multi-Family Residential - Apartment	7.16
Municipal Pool	0.22
Irrigated Landscape	2.50
Total	**15.47**

The proposed elevations within the site range from 1,482 feet to 1,507 feet. Based on the range of elevations and established SCV Water system pressure criteria from the 2013 Water Master Plan (WMP), SCV Water will serve the proposed development from the North Oaks Pressure Zone, with a hydraulic grade line (HGL) that can range from 1753 feet to 1773 feet. The existing North Oaks Pressure Zone piping will extend to the site.

CONNECTION TO EXISTING SYSTEM

The development proposes to construct a separate, privately owned and maintained, onsite water distribution system. The existing North Oak Pressure Zone 12-inch pipeline along Harriman Drive will supply the proposed development via two separate metered connections for the private onsite domestic supply and fire protection pipelines as described below. It is the developer's responsibility to confirm the meter size that will be required to meet domestic and fire flow demands in compliance with all relevant codes and regulations.

1. The development will connect to the North Oak Pressure Zone via the existing 12-inch pipeline along Harriman Drive and two existing 12-inch lateral stub-outs from the existing 12-inch pipeline to serve the private water system. These laterals will be extended to include an 8-inch master meter with a 2-inch meter (in parallel) for metering low flow demands. Placement of the meters and vaults will be coordinated between the developer and SCV Water during design, including easements required for access by SCV Water.

2. The 8-inch master meters are sized to handle fire flow requirements and provide supply redundancy. The developer is required to install an SCV Water approved backflow preventer on the downstream side of each meter. A total of fourteen (14) private fire

hydrants will be connected within the development as discussed in this Technical Memorandum.

PROJECT REQUIREMENTS

The MetroWalk development will be incorporated into the existing North Oaks Pressure Zone. A hydraulic profile of the pressure zone is provided in **Exhibit C** to assist with developing an understanding of how the project will be supported by existing infrastructure.

Following are estimates or citations for average demand, demand fluctuation, and fire flow demand.

AVERAGE DEMAND

Based on the Fire Access/Hydrant Plan Exhibit provided by Alliance Land Planning & Engineering, Inc. (**Exhibit B**), water demand will consist of apartment unit demands, townhouse unit demands, a municipal pool, and irrigated landscaping.

Unit demand factors in Table 2.23 of the 2013 WMP closely correspond to the types of water use proposed for the MetroWalk development.

According to Table 2.23 of the 2013 WMP, the unit demand for irrigated landscaping (including parks/recreation centers) is 2.687 gallons per minute (gpm) per acre based on historical irrigation demand data within the SCV Water service area. The annual irrigation demand is estimated to be approximately 11 acre-feet for the development. New Urban West, Inc. is requesting that SCV Water provide the development with recycled water for onsite irrigation. SCV will receive recycled water supply from the Vista Canyon Water Factory and distribute to customers within the Vista Canyon Ranch and neighboring communities subject to availability of recycled water supply. Based on the estimated demand for the MetroWalk development, SCV Water will be able to provide the development with recycled water. The developer will be responsible for the costs to connect to the existing 6-inch recycled water main in Harriman Drive, including facility capacity fees for a master irrigation meter.

It's the developer's responsibility to request the meter size required for irrigation. It is also the developer's responsibility to comply with all relevant codes and regulations for the onsite recycled water system, including installation and ongoing operation and maintenance.

There are 150 multi-family townhomes that fall under the "Multi-family Residential" land use type that fit closest to the lot size. The unit demand is 0.213 gpm per dwelling unit. There are 348 apartment units proposed. This type of development is categorized under the "Multi-family Residential – Apartment" land use type with a unit demand of 0.202 gpm per dwelling unit. The "municipal pool" type use was chosen for all four pools within the community and have a unit demand of 1.354 gpm per pool. **Table 3** provides an estimate of the incremental increase in average day demand (ADD) for the entire Tract No. 83087 MetroWalk development of **116 gpm**.

Table 3 – Demand Analysis for Entire Development, Average Day Demand (ADD)

Land Use	Lot Size	#	Unit	Factor[a]	Unit	ADD[b] (gpm)
Multi-family Residential	Condo	**150**	DU	0.213	gpm per DU	**32**
Multi-family Residential	Apartment	**348**	DU	0.202	gpm per DU	**71**
Irrigated Landscaping /Park / Recreation Center		**2.5**	Acres	2.687	gpm per acre	**7**
Municipal Pool		**4**	Pools	1.354	gpm per pool	**6**
					Total (gpm)	**116**

DEMAND FLUCTUATION

The development will be constructed using the North Oaks Pressure Zone. Demand fluctuations based on the existing North Oaks Pressure Zone peaking factors are shown in **Table 4.**

Table 4 – Application of North Oaks Pressure Zone Peaking Factors

Demand Scenario	Peaking Factor	Demand (gpm)
ADD	1.00 x ADD	116
MDD	1.62 x ADD	188
PHD	3.29 x ADD	382

[a] Unit demand factors were taken from Table 2.23 of the 2013 WMP.
[b] Rounded to the nearest gpm.

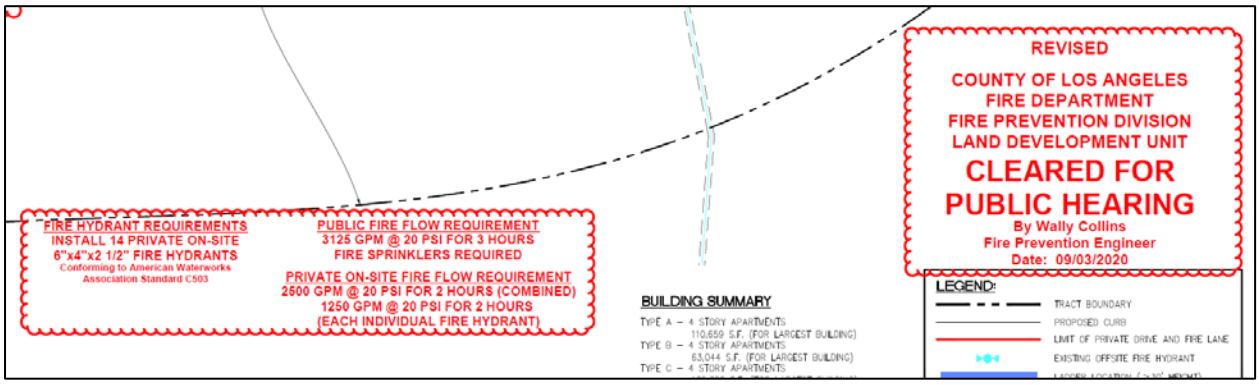
FIRE FLOW DEMAND

Per the Fire Marshal's requirements, there are two fire flow requirements for the MetroWalk development: one for the public hydrants surrounding the proposed development and one for the private onsite hydrants.

The existing four public hydrants require 3,125 gpm of fire flow at a residual pressure of 20 pressure per square inch (psi) for a duration of 3 hours.

For the proposed 14 private onsite hydrants, the fire flow requirement is 2,500 gpm at a residual pressure of 20 psi for 2 hours (combined). The private fire flow requirement can be achieved with two hydrants simultaneously flowing if needed, but each individual hydrant must flow a minimum of 1,250 gpm at 20 psi residual pressure for 2 hours as indicated in **Figure 1** and **Exhibit B**, the approved fire hydrant plan for the development.

Figure 1 – Fire Marshal's Requirements



PROJECT ANALYSIS

A conceptual design has been completed that satisfies all design criteria for new construction per Chapter 8 of the 2013 WMP.

ONSITE INFRASTRUCTURE ANALYSIS

To assess the performance of new infrastructure, the preliminary design of onsite infrastructure (**Exhibit B**) was programmed into the SCV Water computer water model (Water Model) for simulation. Pipelines, including nodes at every pipe intersection, at the end of every dead-end pipe, and fire hydrants as indicated by the Fire Marshal in the approved fire hydrant locations dated September 3, 2020, were programmed into the Water Model. New demands were allocated at each node.

DUAL DOMESTIC WATER AND FIRE SERVICE PIPELINES

Water Modeling Results (12-inch lateral – 8-inch meter)
For the private onsite water system, two 12-inch laterals with 8-inch master meters with a 2-inch low flow meter (in parallel) will be installed from the 12-inch main to serve the MetroWalk development. The master meters were simulated at the entrances as connection 1 and connection 2 (see **Figure 2**). **Table 5** summarizes the Water Model results.

An 8-inch OMNI F^2 meter produces a pressure loss of approximately up to 5 psi at 3,500 gpm and can accommodate up to a maximum intermittent operation flow of 4,700 gpm. These pressure losses and flow were taken into consideration when programming the meter pressure loss curve as shown in **Figure 3**. The pressure drop may vary across the meter accordingly to the flow ranging from less than 1 psi at low flow to roughly about 1 psi at 900 gpm. Each 8-inch meter will include a low flow (2-inch) OMNI T^2 meter in parallel to register low flows for the purposes of SCV Water billing accuracy.

New Urban West Inc, and their engineer shall coordinate with SCV Water during design to confirm the exact placement of the meters and to provide easements as required for proper access by SCV Water for operation and maintenance. The developer will be required to install a backflow preventor on the discharge side of each meter that shall be in accordance with their onsite hydraulic analysis. Prior to the installation, the backflow preventor must be approved by SCV Water.

The meters were tested at each connection individually and simultaneously under three possible scenarios: ADD, maximum day demand (MDD), and MDD plus Fire Flow (MDD+FF).

Figure 2 – Preliminary Design of Distribution System

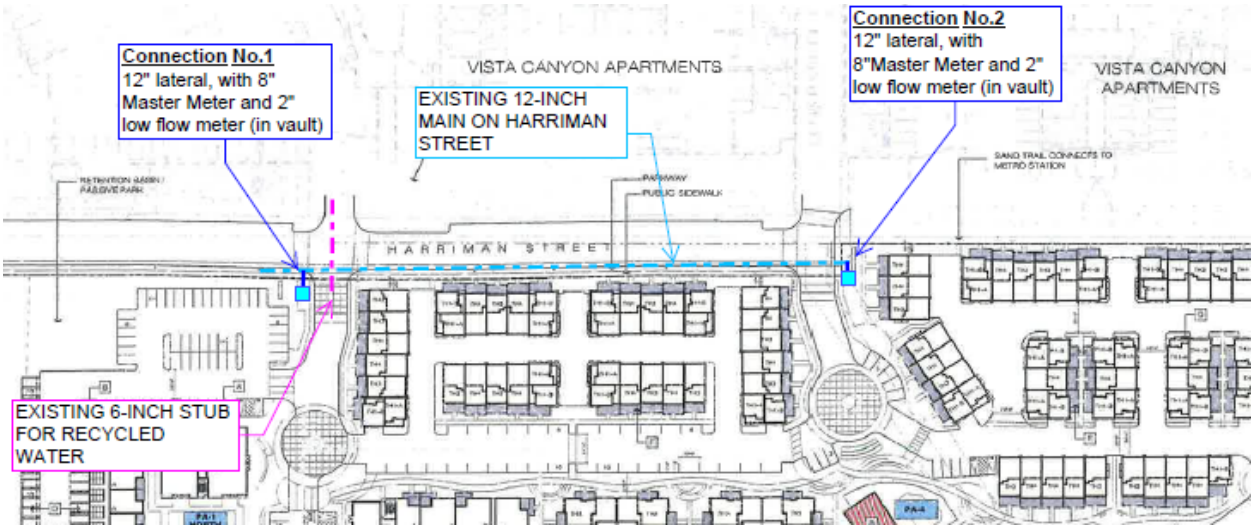
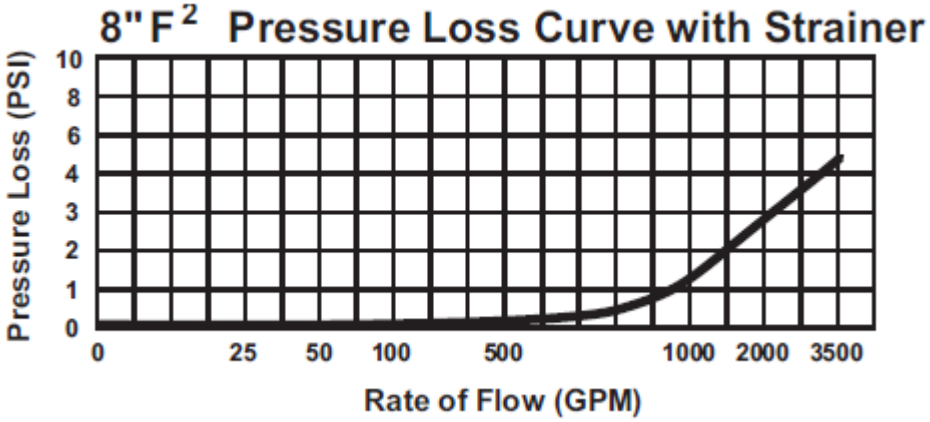


Table 5 – Flows and Residuals of Connections

Scenario	Flow (gpm)	Residual Pressure (psi)	
		Connection 1	Connection 2
ADD	116 gpm	129.6 psi	128.3 psi
MDD	188 gpm	121.7 psi	120.4 psi
MDD+FF	2,688 gpm	117.2 psi	115.8 psi

Figure 3 – Pressure Loss Curve for 8-inch Master Meter[c]



[c] Pressure Loss Curve was obtained from the manufacturer Sensus for the OMNI F^2 Meters. Cut sheet is provided in Exhibit D. Cut sheet for OMNI T2 is also provided in Exhibit D for the 2-inch low flow meter.

It is the responsibility of New Urban West, Inc. to complete a final design of the onsite distribution system and prepare the necessary hydraulic calculations to ensure that required minimum flows and pressures are provided to adequately service the proposed units, pools and irrigation demands.

Distribution Main Criteria
New distribution pipelines were sized to satisfy three conditions:

- MDD+FF with minimum residual pressure of 20 psi,
- Peak hour demand with a minimum system pressure of 40 psi, and
- Maximum pipe velocity of 10 fps[d].

Fire Flow and Pipe Velocity
The Water Model was programmed to simulate a fire flow event at each of the proposed public and private fire hydrant locations under the following conditions:

- MDD,
- All pumps turned off,
- Tanks set to 50% capacity, and
- Steady state analysis.

The simulations returned available fire flow under the following hydraulic constraints:

- 20 psi residual pressure and
- 10 fps maximum pipe velocity.

There fire flow requirements for this development are:

- Four (4) public (offsite) hydrants – 3,125 gpm at 20 psi residual pressure for 3 hours, and
- Fourteen (14) private (onsite) hydrants – 2,500 gpm at 20 psi residual pressure for 2 hours.

All public hydrants are able to achieve their corresponding requirements.

Goal for Normal System Pressure Range (40 psi to 150 psi per the 2013 WMP)
To test for high pressure, the Water Model ran under the following conditions:

- ADD,
- All pumps on,
- Tanks set to 90% capacity, and
- Steady state analysis.

The Water Model returned pressures at the two (2) connection points for the development ranging from **129.6 psi to 128.3 psi** during ADD conditions. To comply with Section 1007 (b) of the

[d] Per 2013 SCWD Water Master Plan Design Criteria for new pipelines, the 10-fps maximum pipe velocity conditions is required for Average day demand, Maximum Day Demand, Maximum Day plus Fire Flow Demand, and Peak Hour Demand conditions. Fire Flow is typically the governing factor is sizing new distribution pipelines.

Uniform Plumbing Code, New Urban West, Inc. shall install individual pressure regulators on all services (after the meter) in portions of service areas where system pressures exceed 80 psi.

To test for low pressure, the Water Model ran under the following conditions:

- MDD,
- All pumps turned off,
- Tanks set to 50% capacity, and
- Steady state analysis.

The Water Model returned MDD pressures at the two (2) water system connection points for the development ranging from **121.7 psi to 120.4 psi** during the MDD conditions.

To test for low pressure, the Water Model ran under the following conditions:

- Peak hour demand,
- All pumps turned off,
- Tanks set to 10% capacity, and
- Steady state analysis.

The Water Model returned peak hour demand pressures at the two (2) water system connection points for the development ranging from **116.3 psi to 114.9 psi** during the peak hour demand conditions.

MetroWalk Development Metering Strategy

The MetroWalk development has a variety of building types that allow for master metering. According to the SCV Water policy, multi-unit or mixed-use residential structures that are sublet are eligible for master meters, as long as the developer demonstrates that these structures will be submetered in compliance with all laws and regulations including SB-7. Compliance with SB-7 includes installation and ongoing maintenance, reading, billing, and testing of submeters for each dwelling unit.

The SCV Water policy requires separate meters for irrigated landscapes in accordance with California Code of Regulations Section 492.7 and California Water Code Section 535.

The MetroWalk development is eligible for master metering per the SCV Water policy. The MetroWalk development will have a total of two (2) 8-inch master meters, each with a 2-inch low flow meter (in parallel), to serve the private water system. It is the developer's responsibility to confirm the meter size that will be required to meet domestic and fire flow demands in compliance with all relevant codes and regulations.

SUPPLY ANALYSIS

Supply referred to in this section is groundwater and imported water. Primary supply design criteria specify that "*there must be sufficient supply to meet MDD with the largest source out of service*".

According to existing conditions, there is a water surplus under primary supply conditions. With the total incremental increase in MDD of 188gpm anticipated to be produced by Tract No. 83087 MetroWalk development, there will still be adequate supply to meet the primary supply criteria.

Secondary supply design criteria specify that *"there must be sufficient supply to meet MDD plus refill of emergency and fire storage in the largest pressure zone with all sources in service"*.

According to existing conditions, there is a surplus under the secondary supply conditions. With the incremental increase in MDD of 188 gpm anticipated to be produced by Tract No. 83087 MetroWalk development, there will still be adequate supply to meet the secondary supply criteria.

STORAGE ANALYSIS

According to the 2013 WMP and existing system infrastructure, there is an existing storage surplus in the North Oaks Pressure Zone of 6.71 million gallons (MG).

Storage design criteria specify that *"storage in each pressure zone is the sum of fire storage, emergency storage and operational storage"*.

- Fire Storage: per Los Angeles County Fire Department Regulation No. 8
- Emergency Storage: 24 hours at MDD
- Operational Storage: 30% of 24 hours at MDD

Existing Storage Conditions

Per **Table 6**, there is an existing storage surplus of 6.71 MG in the North Oaks Pressure Zone.

Table 6 – Existing Storage Conditions

Pressure Zone	Total Storage (MG)	MDD (MGD)	Fire Storage			Operational Storage	Emergency Storage	Total Required Storage	Surplus or (Deficit)
			(gpm)	(hrs)	(MG)	(30% of 1 day of MDD) (MG)	(100% of 1 day of MDD) (MG)	(MG)	(MG)
North Oaks	15.61	5.69	5,000	5	1.50	1.71	5.69	8.90	6.71

Application of Incremental Increase in Demand

The fire storage will remain the same for the North Oaks Pressure Zone. The assumed fire flow requirements for the development is below the existing fire storage.

The operational storage will increase from 0.08 MG to 1.79 MG in the North Oaks Pressure Zone.

$$V_{Operational\ Storage-North\ Oaks} = (0.3)\left(\frac{4{,}141\ gallons}{minute}\right)(24\ hours)\left(\frac{60\ minutes}{hour}\right) \cong 1.79\ MG$$

The emergency storage will increase by 0.27 MG to 5.96 MG in the North Oaks Pressure Zone.

$$V_{Emergency\ Storage-North\ Oaks} = \left(\frac{4{,}141\ gallons}{minute}\right)(24\ hours)\left(\frac{60\ minutes}{hour}\right) \cong 5.96\ MG$$

Comparison of Existing Storage Capacity to New Requirement
Per **Table 7**, there is a storage surplus of 6.36 MG in the North Oaks Pressure Zone after construction of the MetroWalk development.

Table 7 – New Storage Conditions

Pressure Zone	Total Storage (MG)	MDD (MGD)	Fire Storage			Operational Storage (30% of 1 day of MDD) (MG)	Emergency Storage (100% of 1 day of MDD) (MG)	Total Required Storage (MG)	Surplus or (Deficit) (MG)
			(gpm)	(hrs)	(MG)				
North Oaks	15.61	5.96	5,000	5	1.50	1.79	5.96	9.25	6.36

There is adequate existing storage to meet storage design criteria with no additional improvements required.

BOOSTER PUMPING ANALYSIS

According to the 2013 WMP and the existing conditions, there is an existing primary booster pumping surplus in the North Oaks Pressure Zone.

Primary booster pump design criteria specify that the "*combined booster pumping capacity must be sufficient to meet their own MDD plus the MDD of dependent zones with the largest unit out of service*".

There is an existing secondary booster pumping deficit in the North Oaks Pressure Zone.

Secondary booster pump design criteria specify that the "*combined booster pumping capacity must be sufficient to refill emergency and fire storage in each pressure zone in two days (48 hours) with all sources operating*".

Existing Primary Booster Pumping Conditions
Per **Table 8**, there is an existing primary booster pumping surplus of 172 gpm in the North Oaks Pressure Zone.

Table 8 – Existing Primary Booster Pumping Conditions

Pressure Zone	Capacity (gpm)	Dependent MDD (gpm)	Surplus (Deficit) (gpm)
North Oaks	10,100	9,928	172

Application of Incremental Increase in Demand
Dependent MDD will increase from 9,928 gpm by 188 gpm to 10,116 gpm in the North Oaks Pressure Zone.

Comparison of Existing Primary Booster Pumping Capacity to New Requirement
The existing primary booster pumping surplus of 172 gpm in the North Oaks Pressure zone will decrease by 188 gpm and will result in a deficiency of 16 gpm. As shown in **Table 9**, the resulting primary booster deficit will be 16 gpm.

Table 9 – New Primary Booster Pumping Conditions

Pressure Zone	Capacity (gpm)	Dependent MDD (gpm)	Surplus (Deficit) (gpm)
North Oaks	10,100	10,116	(16)

There is a minor deficient booster pumping capacity to meet primary booster pumping design criteria. Additional improvements are discussed in the Secondary Booster Pumping conditions.

Existing Secondary Booster Pumping Conditions
Per **Table 10**, there is an existing secondary booster pumping deficit of 325 gpm in the North Oaks Pressure Zone.

Table 10 – Existing Secondary Booster Pumping Conditions

Pressure Zone	Capacity (gpm)	Fire Storage (MG)	Emergency Storage (MG)	Refill Rate (gpm)	Dependent MDD (gpm)	Total Requirement (gpm)	Surplus (Deficit) (gpm)
North Oaks	12,100	1.50	5.69	2,497	9,928	12,425	(325)

Application of Incremental Increase in Demand
With the anticipated increase in demand, the dependent MDD for North Oaks Pressure Zone will increase by 188 gpm from 9,928 gpm to 10,116 gpm. The new dependent MDD is shown in **Table 11**.

The fire storage will remain the same in the North Oaks Pressure Zone.

Emergency storage will increase by 0.27 MG to 5.96 MG in the North Oaks Pressure Zone.

$$V_{Emergency\ Storage-Plum\ Canyon} = \left(\frac{4{,}141\ gallons}{minute}\right)(24\ hours)\left(\frac{60\ minutes}{hour}\right) \cong 5.96\ MG$$

The refill rate will increase by 93 gpm to 2,590 gpm in the North Oaks Pressure Zone.

$$\frac{V_{Fire\ Storage} + V_{Emergency\ Storage}}{refill\ period} = \frac{1.50\ MG + 5.96\ MG}{48\ hours}\left(\frac{hour}{60\ minutes}\right) = 2{,}590\ gpm$$

Comparison of Existing Secondary Booster Pumping Capacity to New Requirement

As a result of the new MetroWalk development, there will still be a deficit under the secondary booster pumping conditions in the North Oaks Pressure Zone. The deficit will increase from 325 gpm to 606 gpm as shown in **Table 11**.

Table 11 – New Secondary Booster Pumping Conditions

Pressure Zone	Current Capacity (gpm)	Fire Storage (MG)	Emergency Storage (MG)	Refill Rate (gpm)	Dependent MDD (gpm)	Total Requirement (gpm)	Surplus (Deficit) (gpm)
North Oaks	12,100	1.50	5.96	2,590	10,116	12,706	(606)

In addition to the secondary booster pumping deficit described in the 2013 WMP, Vista Canyon Ranch has added another 1,010 gpm for a total deficit of 1,616 gpm. The 2013 WMP identified the SC-12 booster station for improvements to help satisfy the pumping deficiency within the North Oaks Pressure Zone.

The booster station has been constructed and the capacity of SC-12 has been increased. The secondary booster pumping deficit increased by 281 gpm which equates to 9.4% of the capacity of the new SC-12 pump station. The two pumps at SC-12 that feed the North Oaks Zone have a combined capacity of 3000 gpm. The pumping capacity at SC-12 does satisfy the deficit increase from Vista Canyon Ranch and MetroWalk.

IMPLEMENTATION

COST SUMMARY

Itemized cost estimates for the offsite improvements are provided in **Exhibit A**.

There will be no Onsite SCV Water improvements due to the proposed private water system.

The complete offsite improvements include the following:

- 100 feet of 12-inch poly-vinyl chloride (PVC) pipe
- Six (6) – 12-inch butterfly gate valves
- Two (2) – 8-inch master meters with 2-inch low flow meter
- One (1) – 2-inch meter and vault for master irrigation meter.

The Offsite improvements are estimated at $209,625 for construction. The estimated facility capacity fees are $1,391,149 based on 2020 rates.

Please contact the undersigned with any questions regarding these analyses.

Very truly yours,

CIVILTEC engineering, inc.

W. David Byrum, P.E.
Principal Engineer

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Exhibit A - Cost Estimate

Offsite (Overall)

SANTA CLARITA WATER DIVISION
JOB ESTIMATE FORM - Out of Tract
Design Phase Cost Estimate

Project: Tract No. 83087 MetroWalk | Project No. S21-600 | Date: 10/22/2020

Developer: Alliance Land Planning & Engineering, Inc. | By: Gretel Ochoa-Nhac | Zone: North Oaks

	Quantity		COST ESTIMATE TOTAL COST OF PROJECT
PIPE			
4" PVC			
6" PVC			
8" PVC			
10" PVC			
12" PVC	100		$11,900
16" Ductile Iron			
16" PVC			
18" PVC			
20" Ductile Iron			
VALVES & FITTINGS			
4 inch Gate Valve			
6 inch Gate Valve			
8 inch Gate Valve			
10 inch Gate Valve			
12 inch Butterfly Valve	6		$12,750
14 inch Butterfly Valve			
16 inch Butterfly Valve			
18 inch Butterfly Valve			
20 inch Butterfly Valve			
HYDRANTS	**Short**	**Long**	
		4	$42,000
SERVICES	**Short**	**Long**	
1 Inch Service			
1 1/2 Inch Service			
2 Inch Service	2		$4,800
3 Inch Service			
4 Inch Service			
6 Inch Service			
8 Inch Service	2		$13,000
METER & BOX			
1 Inch Service			
1 1/2 Inch Service			
2 Inch Service	2		$2,800
3 Inch Service			
4 Inch Service			
6 Inch Service	1		$7,500
8 Inch Service	2		$15,000
MISC.			
Waterline Tie-Ins	2		$30,000
Subtotal Construction Costs			**$139,750**
Engineering, Permits, GIS, & Inspection	20%		$27,950.00
Overhead and Contingencies	30%		$41,925.00
Subtotal Overhead			**$69,875**
Tank	1		
Well	1		
Booster Station	1		
Domestic Impact Fees*	**Santa Clarita Service Area**		
5/8 Inch			
3/4 Inch			
1 Inch			
1 1/2 Inch			
2 Inch	3		$38,022
2 1/2 inch			
3 Inch			
4 Inch			
6 Inch			
8 Inch	2		$255,184
10 Inch			
Regional Impact Fees*	**WSA: East Valley**		
5/8 Inch			
3/4 Inch			
1 Inch			
1 1/2 Inch			
2 Inch	3		$143,211
2 1/2 inch			
3 Inch			
4 Inch			
6 Inch			
8 Inch	2		$954,732
10 Inch			
Total Estimated Cost			**$1,600,774**

REV.2-19-2020

Exhibit B – Concept Master Plan and Approved Fire Access and Hydrant Plan

NOTE:
DEVELOPER MUST INSTALL BACKFLOW DEVICE IMMEDIATELY DOWNSTREAM OF SCV WATER METER

Connection No.1
12" lateral, with 8" Master Meter and 2" low flow meter (in vault)

EXISTING 12-INCH MAIN ON HARRIMAN STREET

Connection No.2
12" lateral, with 8"Master Meter and 2" low flow meter (in vault)

EXISTING 6-INCH STUB FOR RECYCLED WATER

VISTA CANYON APARTMENTS

VISTA CANYON APARTMENTS

HARRIMAN STREET

PARKWAY

PUBLIC SIDEWALK

RETENTION BASIN / PASSIVE PARK

SAND TRAIL CONNECTS TO METRO STATION

SAND TRAIL CONNECTS TO METRO STATION

PLAZA AT SHOPPING CENTER

NEW METRO STATION

PARK

TOWNHOME GUEST PARKING STALLS

WATER EASEMENT

PARK

ON-GRADE COVERED PARKING

LOST CANYON ROAD

BUS BAY

PA-1 NORTH

PA-1 SOUTH

PA-2

PA-3

PA-4

COURTYARD

LEGEND

- A LOBBY / LEASE OFFICE / COMMUNITY ROOM
- B TRANSFORMER
- C TRASH ROOM
- D COVERED PARKING
- E STORAGE
- F PRIVATE PATIO
- G UTILITY CLOSET

- PA-1 NORTH — ALL AGE MARKET RATE (4-STORY)
- PA-1 SOUTH — ALL AGE MARKET RATE (4-STORY)
- PA-2 — AGE QUALIFIED MARKET RATE (4-STORY)
- PA-3 — SENIOR AFFORDABLE (4-STORY)
- PA-4 — TOWNHOMES (3-STORY)

CONCEPT MASTER PLAN

NEW URBAN WEST INC

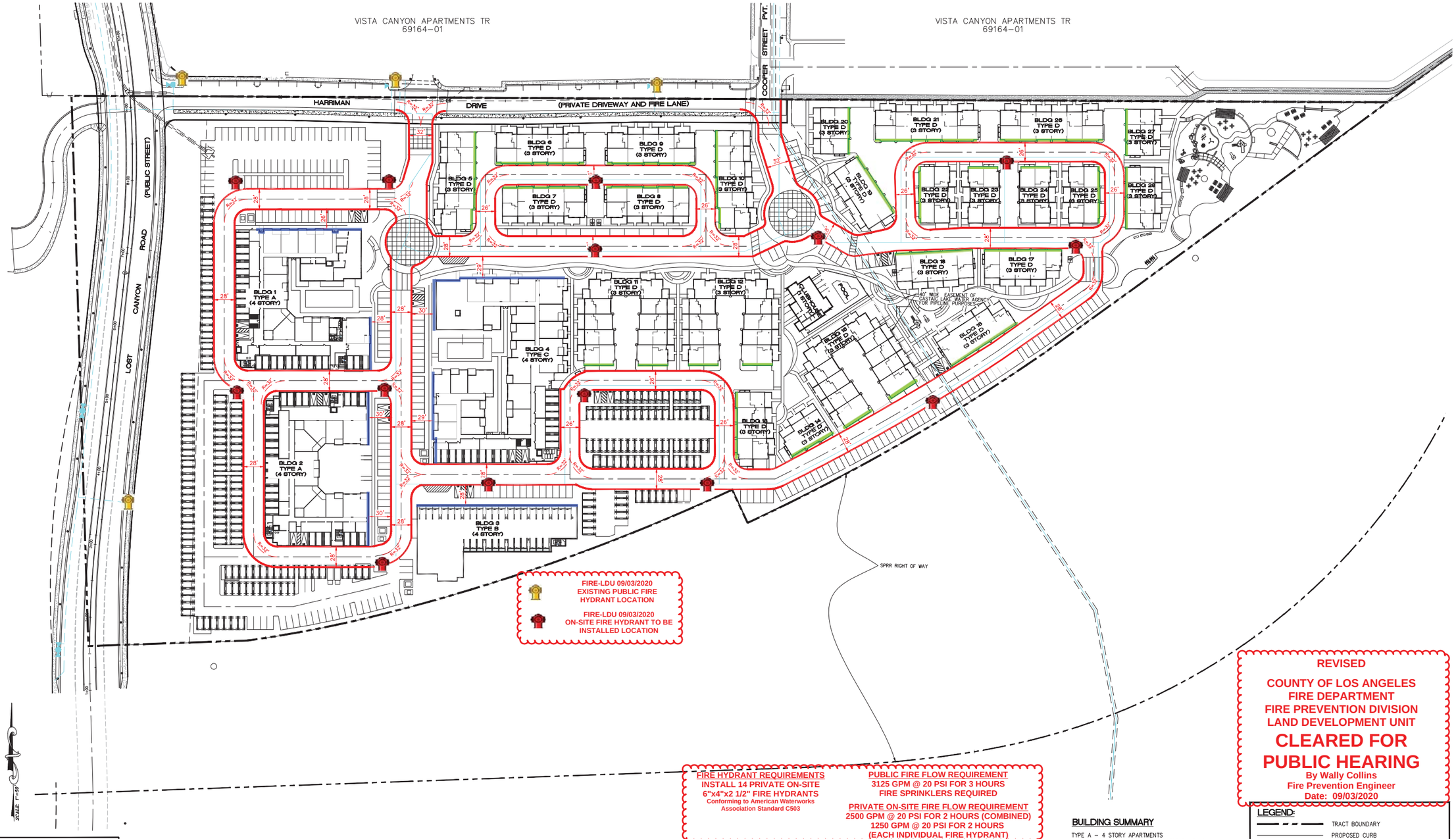
METROWALK
2001 Wilshire Blvd . Ste 401 . Santa Monica , California 90403
P. 310. 566. 6393 F. 310. 566. 6389

scale: 1" = 60'
0 60 120 180

NORTH

WITHEE MALCOLM ARCHITECTS
2251 west 190th street | torrance | ca 90504 | 310.217.8885 | witheemalcolm.com
Job No. B9040 Date 03.24.2020 GS-1-03-

METROWALK
TENTATIVE TRACT MAP 83087
FIRE ACCESS/ HYDRANT PLAN
8/26/20



FIRE-LDU 09/03/2020
EXISTING PUBLIC FIRE HYDRANT LOCATION

FIRE-LDU 09/03/2020
ON-SITE FIRE HYDRANT TO BE INSTALLED LOCATION

FIRE HYDRANT REQUIREMENTS
INSTALL 14 PRIVATE ON-SITE
6"x4"x2 1/2" FIRE HYDRANTS
Conforming to American Waterworks Association Standard C503

PUBLIC FIRE FLOW REQUIREMENT
3125 GPM @ 20 PSI FOR 3 HOURS
FIRE SPRINKLERS REQUIRED

PRIVATE ON-SITE FIRE FLOW REQUIREMENT
2500 GPM @ 20 PSI FOR 2 HOURS (COMBINED)
1250 GPM @ 20 PSI FOR 2 HOURS
(EACH INDIVIDUAL FIRE HYDRANT)

BUILDING SUMMARY

TYPE A – 4 STORY APARTMENTS
110,659 S.F. (FOR LARGEST BUILDING)
TYPE B – 4 STORY APARTMENTS
63,044 S.F. (FOR LARGEST BUILDING)
TYPE C – 4 STORY APARTMENTS
135,382 S.F. (FOR LARGEST BUILDING)
TYPE D – 3 STORY TOWNHOMES
28,597 S.F. (FOR LARGEST BUILDING)

NOTE: ALL BUILDINGS ARE CONSTRUCTION TYPE 5–A

REVISED
COUNTY OF LOS ANGELES
FIRE DEPARTMENT
FIRE PREVENTION DIVISION
LAND DEVELOPMENT UNIT
CLEARED FOR PUBLIC HEARING
By Wally Collins
Fire Prevention Engineer
Date: 09/03/2020

LEGEND:
- TRACT BOUNDARY
- PROPOSED CURB
- LIMIT OF PRIVATE DRIVE AND FIRE LANE
- EXISTING OFFSITE FIRE HYDRANT
- LADDER LOCATION (>30' HEIGHT)
- LADDER LOCATION (≤ 30' HEIGHT)

ALLIANCE
LAND PLANNING & ENGINEERING INC.
CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING
2248 FARADAY AVE.
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-8802
27451 TOURNEY RD.
SUITE 140
SANTA CLARITA, CA 91355
TEL: (661) 799-2760
FAX: (760) 431-8802

I:\CAD\1934\FIRE\1934-FIRE-ACCESS.dwg

Exhibit C - North Oaks Hydraulic Profile

SERVICE ELEVATION AND STATIC PRESSURE RANGE

2100
2000
1900
1800
1700
1600
1500
1400
1300

NORTH OAKSS PRESSURE ZONE
ELEV. 1680 PSI 40
1394 164

FOXLANE SUB-ZONE
ELEV. 1430 PSI 53
1387 71

FELBRIDGE SUB-ZONE
ELEV. 1432 PSI 67
1376 91

DELIGHT SUB-ZONE
ELEV. 1452 PSI 60
1395 84

MANDAN SUB-ZONE
ELEV. 1439 PSI 55
1403 71

GOLDEN VALLEY RANCH PRESSURE ZONE
1990

GOLDEN VALLEY RANCH BOOSTER STATION
1640

LOST CANYON BOOSTER STATION
1617

HONBY PRESSURE ZONE
1548

UPPER FAIR OAKS PRESSURE ZONE
1880

FAIR OAKS TANKS
2.5 MG 1796
2.5 MG 1774

UPPER FAIR OAKS BOOSTER STATION
1751

CHERRY WILLOW PRESSURE ZONE
1892

CHERRY WILLOW BOOSTER STATION
1606

BAKERTON EMERGENCY PRV
1574

SKY BLUE PRESSURE ZONE
1852

NORTH OAKS TANKS
1773
1.0 MG 3.0 MG 4.0 MG 1.0 MG
1743 1773 1751

FOXLANE SUB-ZONE
1552

FOXLANE PRV
1420

FELBRIDGE SUB-ZONE
1586

FELBRIDGE PRV
1429

DELIGHT SUB-ZONE
1589

DELIGHT PRV
1451

MANDAN SUB-ZONE
1566

MANDAN PRV
1451

VIA PRINCESSA BOOSTER STATION
1410

WHITES CANYON BOOSTER STATION
1377

NORTH OAKS BOOSTER STATION
1408

DEANE PRESSURE ZONE
1992

2 EX. PUMP
1 FUTURE PUMP
1586 1550

LINDA VISTA BOOSTER STATION

HONEY HOUSE BOOSTER STATION
1685

NEW DEANE BOOSTER STATION (FUTURE)

FUTURE HYDRAULIC LOOP VIA VISTA CANYON RANCH DEVELOPMENT

LIVE OAK PRESSURE ZONE
1975

FAIRWAY BOOSTER STATION
1751

FAIRWAY TANK
1.5 MG 1773 1751

SAND CANYON TANK
0.11 MG 1767 1745

PLACERITA PRESSURE ZONE
2075

SAND CANYON RESERVOIR
1793.5

SAND CANYON BOOSTER STATION
1670

SC-12 PRV
1668

FAIRWAY ZONE VALVES (NORMALLY OPEN)

SOLEDAD CANYON BOOSTER STATION
1569

SC-6 PRV
1492

SC-10 PRV
1435

SC-11 PRV
1434

SIERRA WELL

MITCHELL 5A WELL 1490
MITCHELL 5B WELL
SAND CANYON WELL 1529
LOST CANYON 2A WELL 1534
LOST CANYON 2 WELL 1536

LEGEND

- WATER SURFACE
- 1773 / 1743 – TANK
- WELL
- PUMP
- VALVE
- PRESSURE REDUCING STATION

SCV WATER
CIVILTEC engineering inc.
118 W Lime Ave.
Monrovia, CA 91016
Phone: 626.357.0588
Fax: 626.303.7957
Web: www.civiltec.com

SANTA CLARITA WATER DIVISION
2013 WATER MASTER PLAN

NORTH OAKS PRESSURE ZONE

HYDRAULIC PROFILE
H.7

Exhibit D – OMNI F^2 and OMNI T^2 Cut Sheets

OMNI™ F²

4”, 6”, 8” and 10” OMNI F² Meter

Description

4”, 6”, 8” and 10” Sizes

The OMNI F² meter operation is based on advanced Floating Ball Technology (FBT).

AMR/AMI Mode | Totalization Mode | Resettable Test Mode

Features

CONFORMANCE TO STANDARDS

The OMNI F² meter meets and far exceeds the most recent revision of AWWA Standard C703 class II. Additionally, the meter does not require a valve to meet these standards. Each meter is performance tested to ensure compliance. All OMNI meters are NSF/ANSI Standard 61, Annex F and G approved. The OMNI F² meter is UL (Underwriters Laboratories) Listed and FM (Factory Mutual) approved for use on fire protection and domestic water applications.

PERFORMANCE

The patented measurement principles of the OMNI F² meter assure enhanced accuracy ranges, an overall greater accuracy, and a longer service life than any other comparable class meter produced. The F² meter has no restrictions as to sustained flow rates within its continuous operating range. The floating ball measurement technology allows for flows up to its rated maximum capacity without undue wear or accuracy degradation.

CONSTRUCTION

The OMNI F² meter consists of two basic assemblies; the maincase and the measuring chamber. The measuring chamber assembly includes the “floating ball” impeller with a coated titanium shaft, hybrid axial bearings, integral flow straightener and an all electronic programmable register with protective bonnet. The maincase is made from industry proven Ductile Iron with an approved NSF epoxy coating. Maincase features are; easily removable measuring chamber, unique chamber seal to the maincase using a high pressure o-ring, testing port and a convenient integral strainer with optional drain/debris-flushing ports.

OMNI ELECTRONIC REGISTER

The OMNI F² electronic register is hermetically sealed with electronic pickup containing no mechanical gearing. The large character LCD displays AMR, Totalization and a Resettable Test Totalizer. OMNI register features; AMR resolution units that are fully programmable, Pulse output frequency that are fully programmable, Integral customer data logging capability, Integral resettable accuracy testing feature compatible with the UniPro Testing Assistant Program, Large, easy-to-read LCD also displays both forward and reverse flow directions and all with a 10-year battery life guarantee.

MAGNETIC DRIVE

Meter registration is achieved by utilizing a fully magnetic pickup system. This is accomplished by the magnetic actions of the embedded rotor magnets and the ultra sensitive register pickup probe. The only moving component in water is the “floating ball” impeller.

MEASURING ELEMENT

The revolutionary thermoplastic, hydro dynamically balanced impeller floats between the bearings. The Floating Ball Technology (FBT) allows the measuring element to operate virtually without friction or wear, thus creating the extended upper and lower flow ranges capable on only the OMNI F² meter.

STRAINER

The OMNI F² meter includes the Sensus designed “V” shaped UL Listed/FM approved strainer which utilizes a stainless steel screen along with Floating Ball Technology (FBT) to create a design that gives far improved accuracy even in those once thought questionable settings. A removable strainer cover permits easy access to the screen for routine maintenance. Optional drain ports, located at the back lower corners of the strainer body, allow for easy discharging of debris without the need to remove the cover.

MAINTENANCE

The OMNI F² meter is designed for easy maintenance. Should any maintenance be required, the measuring chamber and/or strainer cover can be removed independently. Parts and or a replacement measuring chamber may be utilized in the event repairs are needed. Replacement Measuring Chambers are available for the OMNI F² meters.

AMR / AMI SYSTEMS

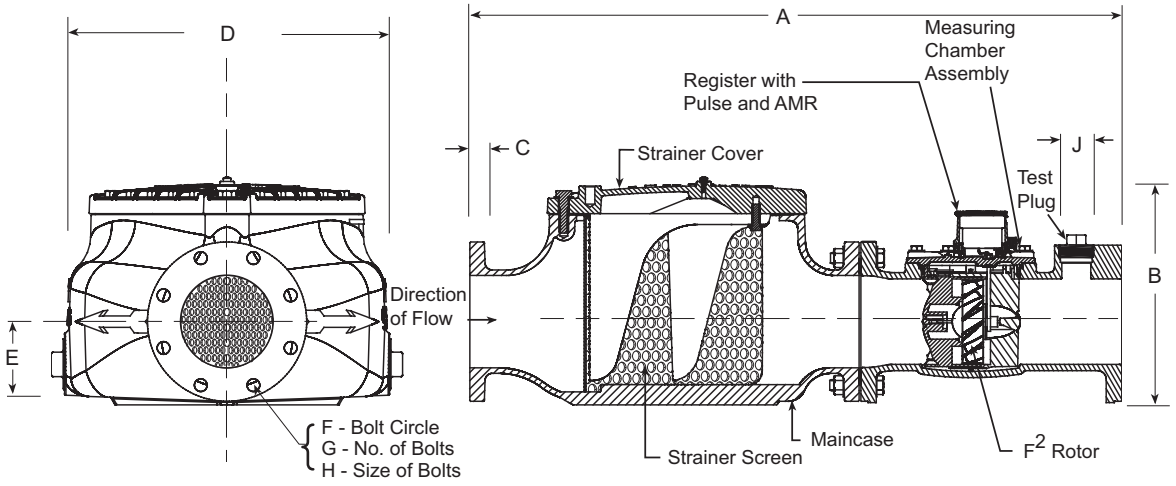
Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE

Sensus OMNI F² Meters are backed by “The Sensus Guarantee.” Ask your Sensus representative for details or see Bulletin G-500.

sensus

OMNI F²: 4”, 6”, 8” and 10”



DIMENSIONS AND NET WEIGHTS

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight	Standard Fireline
4” DN 100mm	1.5 gpm .34 m³/hr	1000 gpm 227 m³/hr	Flanged	33” 838mm	13-11/16” 348mm	15/16” 24mm	17-1/2” 446mm	4-3/4” 121mm	7-1/2” 191mm	8	5/8” 16mm	2” 50mm	212 lbs. 96 kg.	252 lbs. 115 kg.	51-7/8” (1317mm)
6” DN 150mm	3.0 gpm .681 m³/hr	2000 gpm 454 m³/hr	Flanged	45” 1143mm	15-3/4” 400mm	15/16” 24mm	22-3/8” 569mm	5-3/4” 146mm	9-1/2” 242mm	8	3/4” 19mm	2” 50mm	394 lbs. 179 kg.	449 lbs. 204 kg.	67-5/8” (1717mm)
8” DN 200mm	4 gpm .91 m³/hr	3500 gpm 795 m³/hr	Flanged	53” 1346mm	18-1/2” 470mm	11/16” 17mm	31” 787mm	6-3/4” 172mm	11-3/4” 298mm	8	3/4” 19mm	2” NPT	736 lbs. 334 kg.	786 lbs. 357 kg.	77” (1956mm)
10” DN 250mm	5 gpm 1.1 m³/hr	5500 gpm 1249 m³/hr	Flanged	68” 1727mm	22-1/4” 565mm	11/16” 17mm	37-1/3” 947mm	8-1/2” 216mm	14-1/4” 362mm	12	7/8 22mm	2” NPT	1155 lbs. 524 kg.	1215 lbs. 551 kg.	90” (2286mm)

[1] **Standard Fireline lay length with optional spool piece added.**

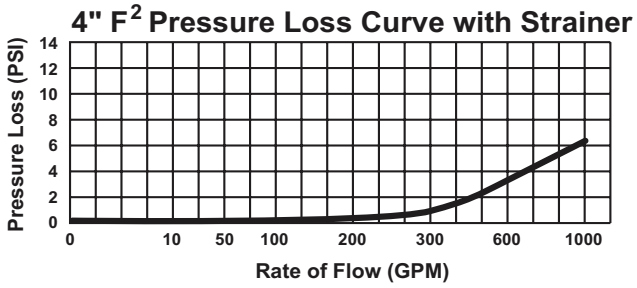
SPECIFICATIONS

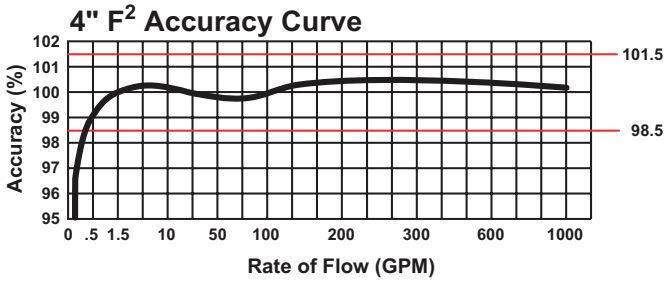
SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 ºF (56 ºC) - 150 ºF (65.6 ºC)
OPERATING RANGE (100% ± 1.5%)	4”: 1.5 – 1000 GPM (.34 - 227 m³/hr) 6”: 3.0 – 2000 GPM (.34 - 227 m³/hr) 8”: 4– 3500 GPM (0.91-795 m³/hr) 10”: 5– 5500 GPM (1.1-1249 m³/hr)
LOW FLOW (95% – 101.5%)	4”: .75 GPM (.06 m³/hr) 6”: 1.5 GPM (.06 m³/hr) 8”: 2.5 GPM (0.57 m³/hr) 10”: 3.5 GPM (0.8 m³/hr)
UL MINIMUM FLOW	8”: 97% @ 3 GPM (0.68 m³/hr) 10”: 97% @ 4 GPM (0.9 m³/hr)
MAXIMUM CONTINUOUS OPERATION	4”: 1000 GPM (227 m³/hr) 6”: 2000 GPM (454 m³/hr) 8”: 3500 GPM (795 m³/hr) 10”: 5500 GPM (1249 m³/hr)
MAXIMUM INTERMITTENT OPERATION	4”: 1250 GPM (284 m³/hr) 6”: 2500 GPM (568 m³/hr) 8”: 4700 GPM (1067 m³/hr) 10”: 7000 GPM (1590 m³/hr)

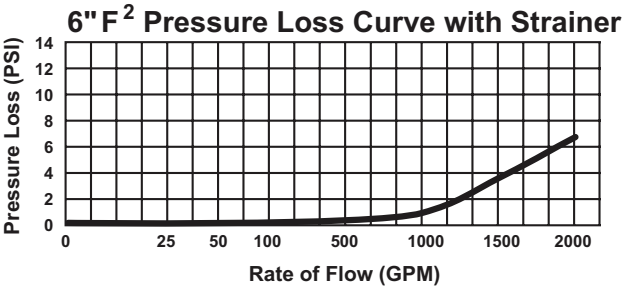
PRESSURE LOSS	4”: 6.4 psi @ 1000 GPM (.60 bar @ 227 m³/hr) 6”: 6.7 psi @ 2000 GPM (.56 bar @ 454 m³/hr) 8”: 5 psi @ 3500 GPM (.34 bar @ 795 m³/hr) 10”: 7 psi @ 5500 GPM (.48 bar @ 1249 m³/hr)
MAXIMUM OPERATING PRESSURE	175 PSI (12 bar)
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Ft./ Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life
NSF APPROVED MATERIALS	**Maincase:** Coated Ductile Iron **Measuring Chamber:** Thermoplastic **Rotor “Floating Ball”:** Thermoplastic **Radial Bearings:** Hybrid Thermoplastic **Thrust Bearings:** Sapphire/Ceramic Jewel **Magnets:** Ceramic Magnet **Strainer Screen:** Stainless Steel **Strainer Cover:** Coated Ductile Iron **Test Plug:** Coated Ductile Iron

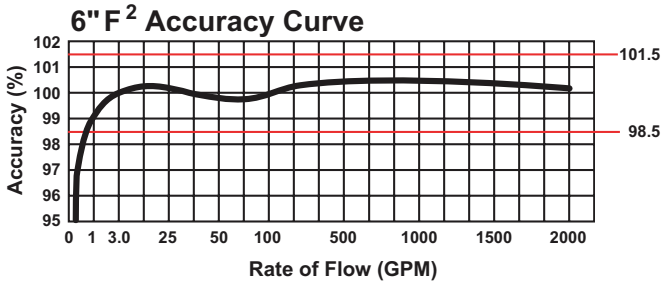
OMNI F²: 4”, 6”, 8” and 10”

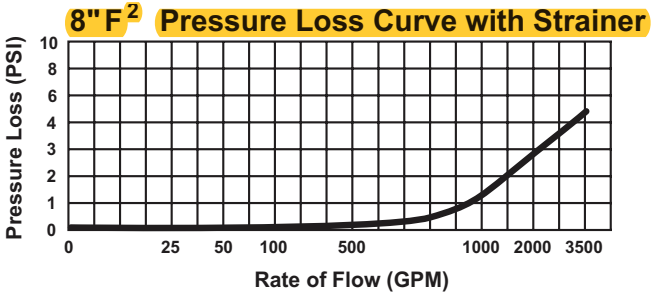
Headloss Curves

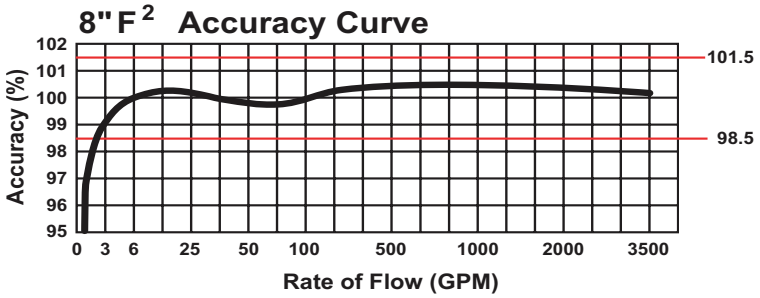


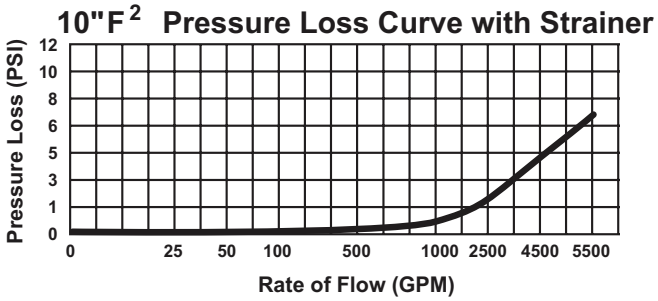


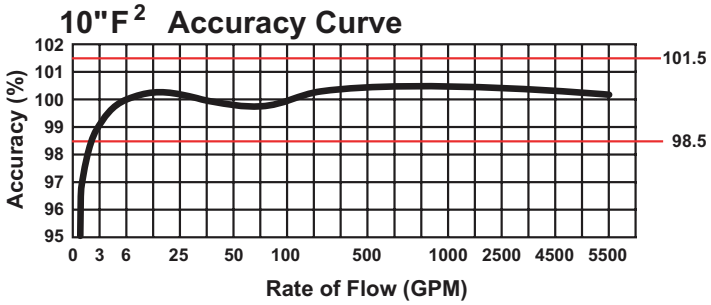












8601 Six Forks Road, Suite 700
Raleigh, NC 27615
1-800-638-3748
www.sensus.com/water

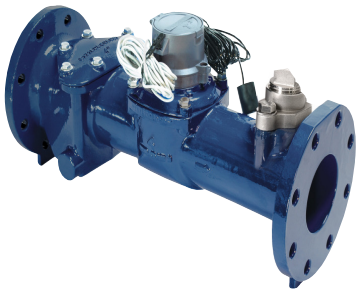
OMNI™ T²

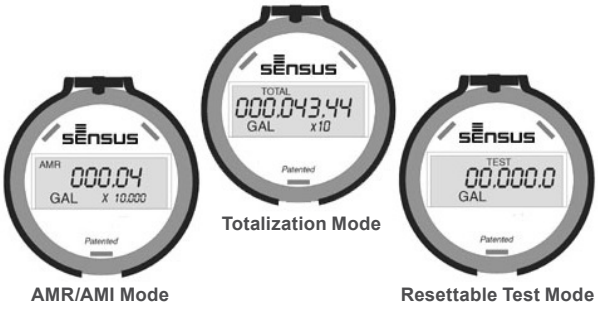
1-1/2”, 2”, 3”, 4”, 6”, 8” and 10” OMNI T² Meter

Description

1-1/2”, 2”, 3”, 4”, 6”, 8” and 10” Sizes

The OMNI T² meter operation is based on advanced Floating Ball Technology (FBT).





AMR/AMI Mode

Totalization Mode

Resettable Test Mode

Features

CONFORMANCE TO STANDARDS

The OMNI T² meter meets and far exceeds the most recent revision of AWWA Standard C701 class II standards. Each meter is performance tested to ensure compliance. All OMNI meters are NSF/ANSI Standard 61, Annex F and G approved.

PERFORMANCE

The patented measurement principles of the OMNI T² meter assure enhanced accuracy ranges, an overall greater accuracy, and a longer service life than any other comparable class meter produced. The OMNI T² meter has no restrictions as to sustained flow rates within its continuous operating range. The floating ball measurement technology allows for flows up to its rated maximum capacity without affecting undue wear or accuracy degradation when installed in any orientation.

CONSTRUCTION

The OMNI T² meter consists of two basic assemblies; the maincase and the measuring chamber. The measuring chamber assembly includes the “floating ball” impeller with a coated titanium shaft, hybrid axial bearings, integral flow straightener and an all electronic programmable register with protective bonnet. The maincase is made from industry proven Ductile Iron with an approved NSF epoxy coating. Maincase features are; easily removable measuring chamber, unique chamber seal to the maincase using a high pressure o-ring, testing port and a convenient integral strainer.

OMNI ELECTRONIC REGISTER

The OMNI T² electronic register consist of a hermetically sealed register with an electronic pickup containing no mechanical gearing. The large character LCD displays AMR, Totalization and a Resettable Test Totalizer. OMNI register features; AMR resolution units that are fully programmable, Pulse output frequency that are fully programmable, Integral customer data logging capability, Integral resettable accuracy testing feature compatible with the UniPro Testing Assistant Program, Large, easy-to-read LCD also displays both forward and reverse flow directions and all with a 10-year battery life guarantee.

MAGNETIC DRIVE

Meter registration is achieved by utilizing a fully magnetic pickup system. This is accomplished by the magnetic actions of the embedded rotor magnets and the ultra sensitive register pickup probe. The only moving component in water is the “floating ball” impeller.

MEASURING ELEMENT

The revolutionary thermoplastic, hydro dynamically balanced impeller floats between the bearings. The Floating Ball Technology (FBT) allows the measuring element to operate virtually without friction or wear, thus creating the extended upper and lower flow ranges capable on only the OMNI T² meter.

STRAINER

The OMNI T² with the “V” shaped integral strainer using a stainless steel screen along with Floating Ball Technology (FBT) create a design that gives far improved accuracy even in those once thought questionable settings. A removable strainer cover permits easy access to the screen for routine maintenance.

MAINTENANCE

The OMNI T² meter is designed for easy maintenance. Should any maintenance be required, the measuring chamber and / or strainer cover can be removed independently. Parts and or a replacement measuring chamber may be utilized in the event repairs are needed. Replacement Measuring Chambers Exchange are available for the OMNI T² meters and may also be utilized for retrofitting to competitive meters to achieve increased accuracy and extended service life.

AMR / AMI SYSTEMS:

Meters and encoders are compatible with current Sensus AMR/AMI systems.

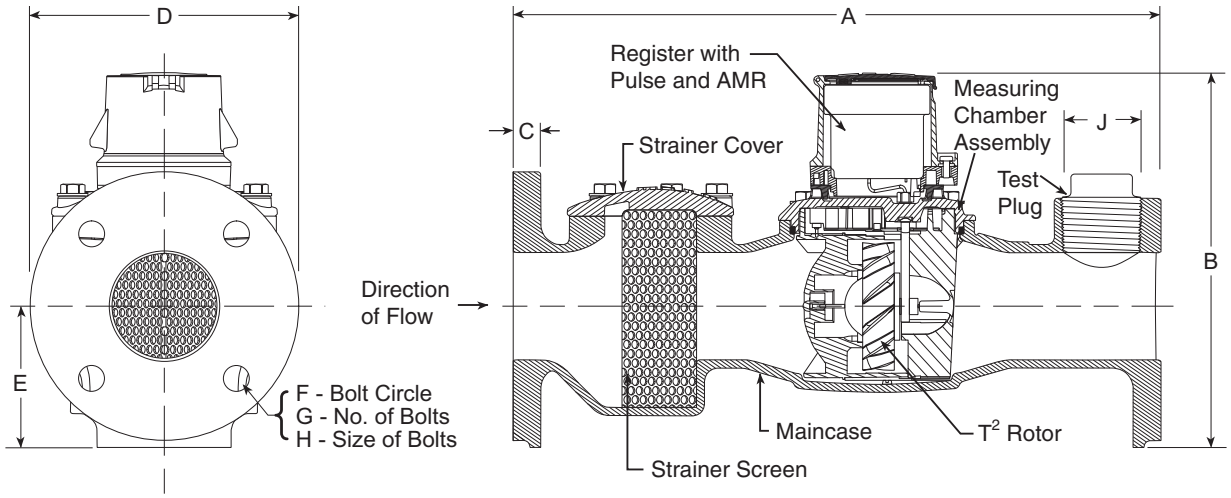
GUARANTEE:

Sensus OMNI T² Meters are backed by “The Sensus Guarantee.” Ask your Sensus representative for details or see Bulletin G-500.

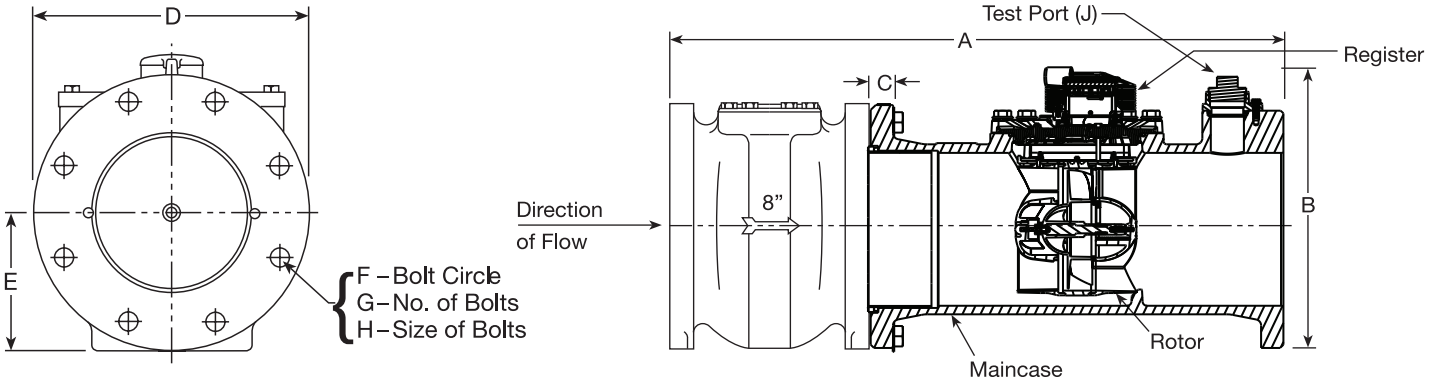
sensus

OMNI T²: 1-1/2”, 2”, 3”, 4”, 6”, 8” and 10” Sizes

OMNI T²: 1 1/2” - 6”



OMNI T²: 8” - 10”



DIMENSIONS AND NET WEIGHTS

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight
1-1/2” DN 40mm	1.25 gpm .28 m³/hr	200 gpm 45 m³/hr	Flanged	13” 330mm	7-7/8” 200mm	15/16” 24mm	5-1/8” 130mm	2-5/16” 59mm	4” 102mm	2	5/8” 16mm	1” 25mm	18.8 lbs. 8.53 kg..	22.5 lbs. 10.20 kg.
2” DN 50mm	1.5 gpm .34 m³/hr	250 gpm 57 m³/hr	Flanged	17” 432mm	7-7/8” 200mm	1” 25mm	5-3/4” 146mm	2-5/16” 59mm	4-1/2” 114mm	2	3/4” 19mm	1-1/2” 40mm	27.4 lbs. 12.42 kg.	34.5 lbs. 15.65 kg.
2” without Strainer DN 50mm	1.5 gpm .34 m³/hr	250 gpm 57 m³/hr	Flanged	10” 254mm	7-7/8” 200mm	1” 25mm	5-3/4” 146mm	2-5/16” 59mm	4-1/2” 114mm	2	3/4” 19mm	N/A	17.4 lbs. 7.9 kg.	24.5 lbs. 11.11 kg.
3” DN 80mm	2.5 gpm .57 m³/hr	650 gpm 148 m³/hr	Flanged	19” 432mm	8-3/4” 222mm	3/4” 19mm	7-7/8” 200mm	4-1/8” 105mm	6” 153mm	4	5/8” 16mm	2” 50mm	48.5 lbs. 22.00 kg.	57.4 lbs. 26.04 kg.
4” DN 100mm	3.0 gpm .68 m³/hr	1250 gpm 284 m³/hr	Flanged	23” 584mm	11-3/16” 284mm	15/16” 24mm	9-1/8” 232mm	4-3/4” 121mm	7-1/2” 191mm	8	5/8” 16mm	2” 50mm	67.9 lbs. 30.80 kg.	75.8 lbs. 34.38 kg.
6” DN 150mm	4 gpm .91 m³/hr	2500 gpm 568 m³/hr	Flanged	27” 685mm	13-1/4” 336mm	15/16” 24mm	11” 279mm	5-3/4” 146mm	9-1/2” 242mm	8	3/4” 19mm	2” 50mm	140 lbs. 52.3 kg.	165 lbs. 61.6 kg.
8” DN 200mm	5 gpm 1.1 m³/hr	3500 gpm 795 m³/hr	Flanged	30-1/8” 765 mm	15” 381 mm	11/16” 17 mm	13-1/2” 343 mm	6-3/4” 172 mm	11-3/4” 300 mm	8	3/4” 19 mm	2” NPT	471 lbs. 214 kg.	521 lbs. 236 kg.
10” DN 250mm	6 gpm 1.4 m³/hr	5500 gpm 1249 m³/hr	Flanged	41-1/8	19” 485mm	11/16” 17mm	16” 406mm	8-1/2” 216mm	14-1/4” 362mm	12	7/8” 22mm	2” NPT	685 lbs. 311 kg.	745 lbs. 338 kg.

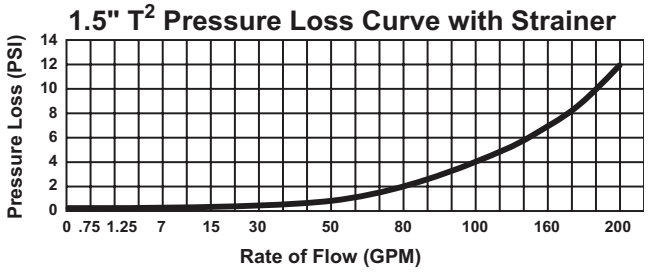
OMNI T²: 1-1/2”, 2”, 3”, 4”, 6”, 8” and 10” Sizes

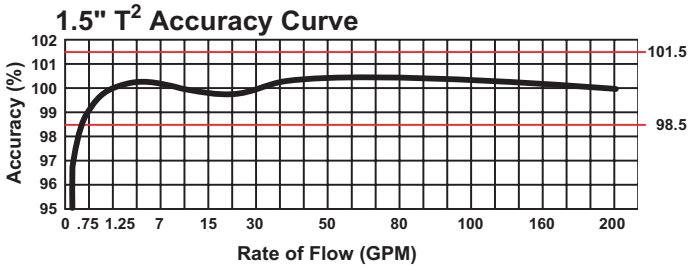
SPECIFICATIONS

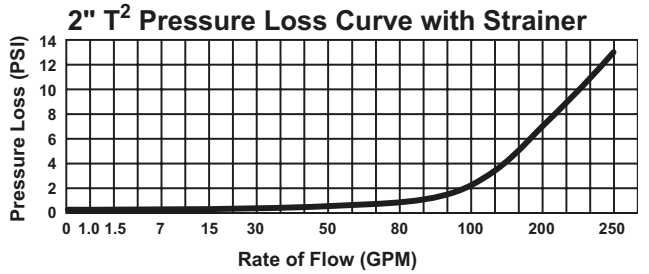
SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 ºF (56 ºC) - 150 ºF (65.6 ºC)
OPERATING RANGE (100% ± 1.5%)	1-1/2”: 1.25 – 200 GPM (.28 - 45 m³/hr) 2” and 2” without Strainer: 1.5 – 250 GPM (.34 – 57 m³/hr) 3”: 2.5 – 650 GPM (.57 – 148 m³/hr) 4”: 3 – 1250 GPM (.68 – 284 m³/hr) 6”: 4 – 2500 GPM (.91 – 568 m³/hr) 8”: 5 – 3500 GPM (1.1-795 m³/hr) 10”: 6 – 5500 GPM (1.4 - 1249 m³/hr)
LOW FLOW (95% – 101.5%)	1-1/2”: .75 GPM (.17 m³/hr) 2” and 2” without Strainer: 1.0 GPM (.23 m³/hr) 3”: 1.5 GPM (.34 m³/hr) 4”: 2.0 GPM (.45 m³/hr) 6”: 2.5 GPM (.57 m³/hr) 8”: 4 GPM (0.9 m³/hr) 10”: 5 GPM (1.1 m³/hr)
MAXIMUM CONTINUOUS OPERATION	1-1/2”: 160 GPM (36 m³/hr) 2” and 2” without Strainer: 200 GPM (45 m³/hr) 3”: 500 GPM (114 m³/hr) 4”: 1000 GPM (227 m³/hr) 6”: 2000 GPM (454 m³/hr) 8”: 3500 GPM (795 m³/hr) 10”: 5500 GPM (1249 m³/hr)
MAXIMUM INTERMITTENT OPERATION	1-1/2”: 200 GPM (45 m³/hr) 2” and 2” without Strainer: 250 GPM (57 m³/hr) 3”: 650 GPM (148 m³/hr) 4”: 1250 GPM (284 m³/hr) 6”: 2500 GPM (568 m³/hr) 8”: 4700 GPM (1067 m³/hr) 10”: 7000 GPM (1590 m³/hr)
PRESSURE LOSS	1-1/2”: 6.9 psi @ 160 GPM (48 bar @ 36 m³/hr) 2” and 2” without Strainer: 7.0 psi @ 200 GPM (.48 bar @ 45 m³/hr) 3”: 5.1 psi @ 500 GPM (.35 bar @ 114 m³/hr) 4”: 8.7 psi @ 1000 GPM (.60 bar @ 227 m³/hr) 6”: 8.2 psi @ 2000 GPM (.56 bar @ 454 m³/hr) 8”: 5.1 psi @ 3500 GPM (.35 bar @ 795 m³/hr) 10”: 7.2 psi @ 5500 GPM (.50 bar @ 1249 m³/hr)
MAXIMUM OPERATING PRESSURE	200 PSI (13.8 bar)
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Ft./ Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life
NSF APPROVED MATERIALS	**Maincase:** Coated Ductile Iron **Measuring Chamber:** Thermoplastic **Rotor “Floating Ball”:** Thermoplastic **Radial Bearings:** Hybrid Thermoplastic **Thrust Bearings:** Sapphire/Ceramic Jewel **Magnets:** Ceramic Magnet **Strainer Screen:** Stainless Steel **Strainer Cover:** Coated Ductile Iron **Test Plug:** Coated Ductile Iron

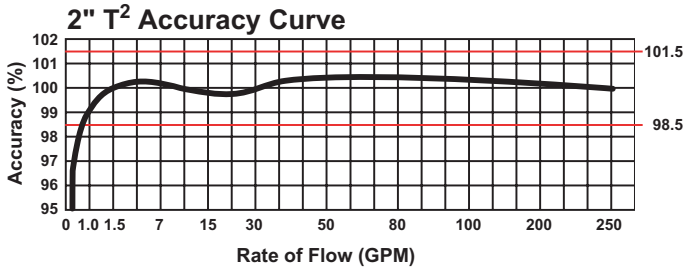
OMNI T²: 1-1/2”, 2”, 3”, 4”, 6”, 8” and 10” Sizes

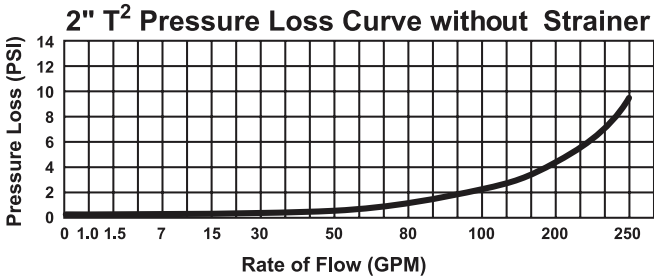
Headloss Curves

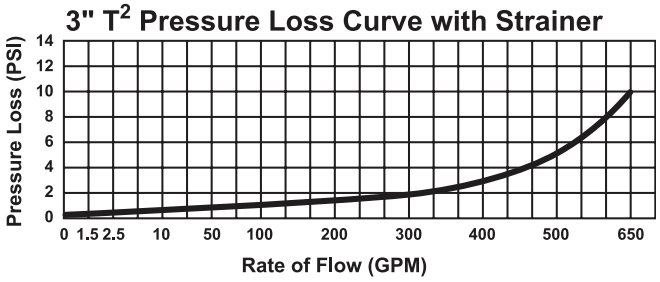


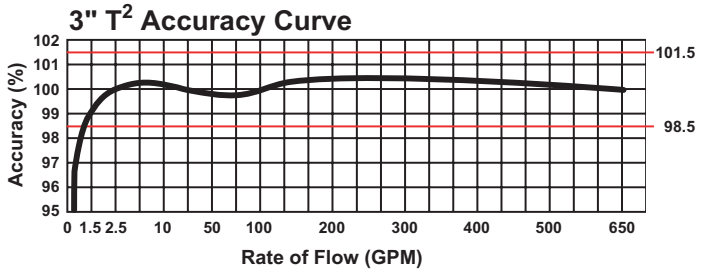


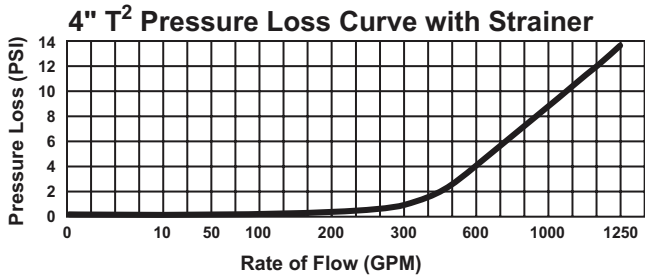


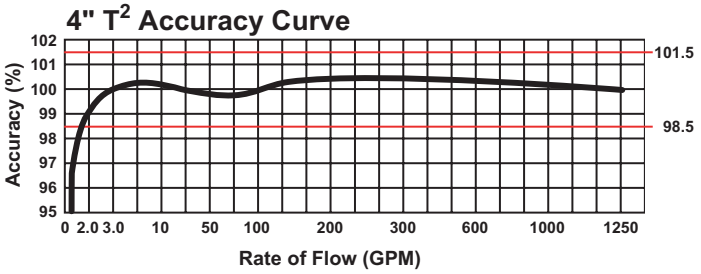






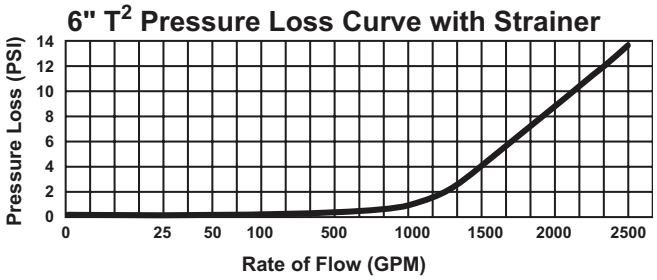


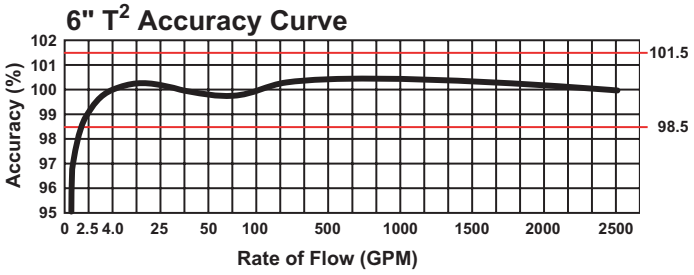


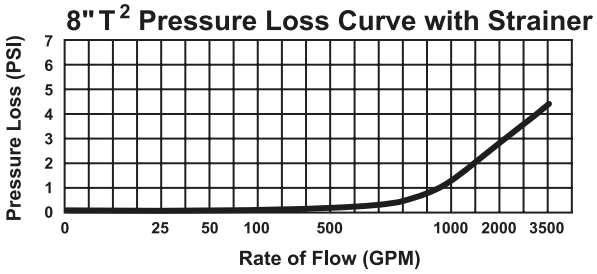


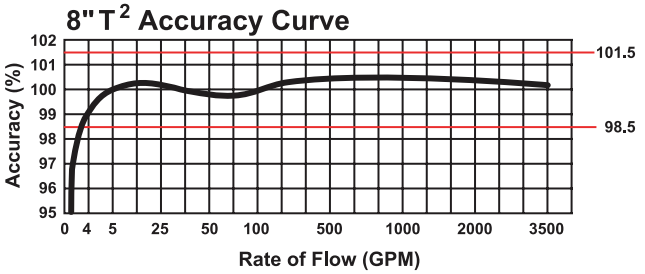
OMNI T²: 1-1/2”, 2”, 3”, 4”, 6”, 8” and 10” Sizes

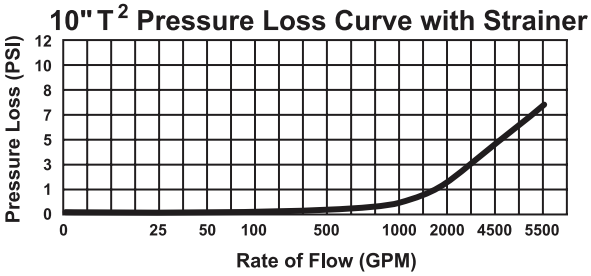
Headloss Curves

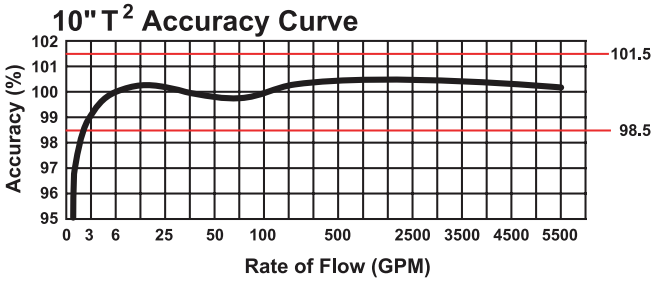












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