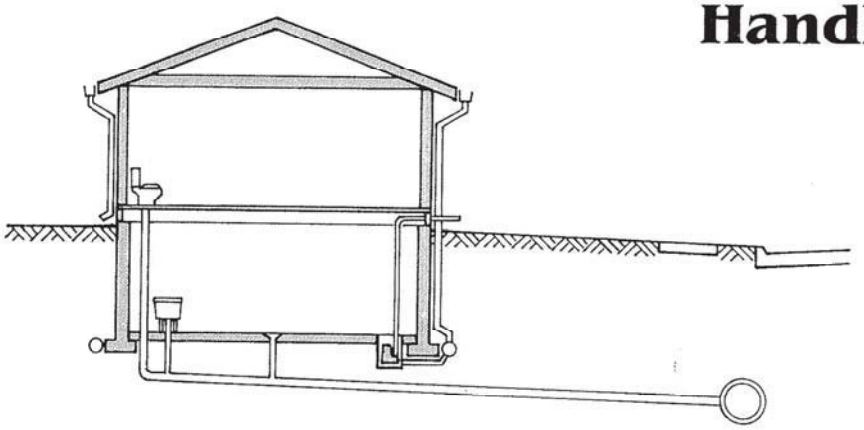
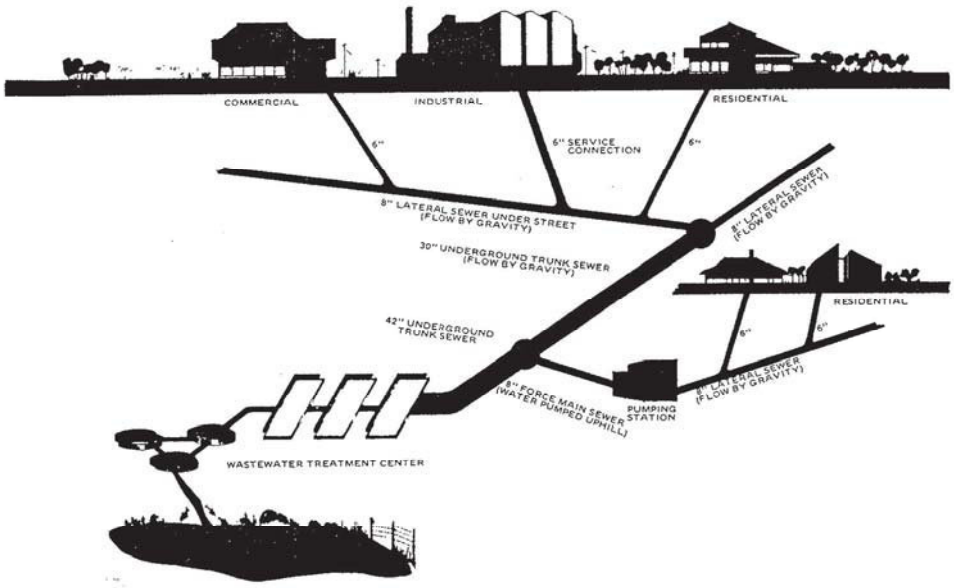
Downers Grove Sanitary District Sanitary Sewer Backup Handbook



2710 Curtiss Street
Downers Grove, Illinois 60515
969-0664

DOWNERS GROVE SANITARY DISTRICT
WASTEWATER COLLECTION SYSTEM



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I. Foreword

This handbook has been prepared by the Downers Grove Sanitary District to explain the causes of sewer backups that occur in the District during severe rainstorms and to describe steps that are available to homeowners to prevent backups and to protect the contents of their house.

Sanitary sewer backups have three main causes: a blockage located in the private sewer lateral (service line) from the house to the public sewer, a blockage in the public sewer main, or an overloading of the public sewer main during rainstorms.

While this handbook addresses backups which occur during rainstorms, the preventive measures and methods of correction will help to prevent backups caused by blockages of the service line and main sewer.

Even if you do not experience sewer backups, we hope that you will study the information since, quite unknowingly, you may be contributing to the problems. Your house may be contributing storm water runoff or ground water to the sanitary sewer system through plumbing connections that were made when the house was constructed. The storm or ground water may overload the sanitary sewer system and cause backups of sanitary sewage in some other resident's basement. You can help the situation by disconnecting these storm or ground water sources.

You should report a sanitary sewer backup as soon as it occurs and before you call a plumber. The District's telephone number, 969-0664, is manned at all times. District personnel will respond as discussed on page 16 of this handbook.

It is important to realize that backups may occur at any time due to blockages of your service line or the public sewer main, or during extreme rainstorm events. Therefore, you should consider improvements to your house to prevent future sewer backups. Since the improvements that will solve a problem in one situation may not be effective in other situations, the knowledge and skill of an engineer, a plumber and/or a sewer contractor may be needed to find the proper solution to the problem. Therefore, the only specific recommendation that can be made to all residents is: **secure competent help and advice in determining the proper course of action to be taken.**

The purposes of this handbook are to help you understand the real nature of your specific problem, to suggest methods that you may use to resolve the problem, and to explain when competent help is necessary to solve the problem.

II. The Nature of the Backup Problems

The Downers Grove Sanitary District owns and maintains a separate sanitary sewer system that is designed to collect only the sewage from the buildings in the District. If that were actually the case, many of the backup problems would not exist. Unfortunately, during rainstorms, storm water gets into the sanitary sewers which causes the basement backups.

The sanitary sewers are designed to collect the wastewater from the bathrooms, kitchens, etc., and transport it to the District's Wastewater Treatment Center for purification and discharge to the DuPage River. The system includes the District's sanitary sewer mains beneath the streets and the individual building services that extend from each house or building to the main sewer. The sanitary sewers are not designed to collect or transport the large amounts of storm water runoff that results from a rainstorm. Whenever significant amounts of storm water get into the sanitary sewers, the system's capacity is exceeded and surcharging (overloading) of the system and basement backups occur. Normally, the sanitary sewage enters the basement through the floor drain which is the lowest access point. If the surcharge elevation is much higher than the floor drain or if the drain is plugged, the sewage can enter the basement through a shower drain, toilet, or laundry tub.

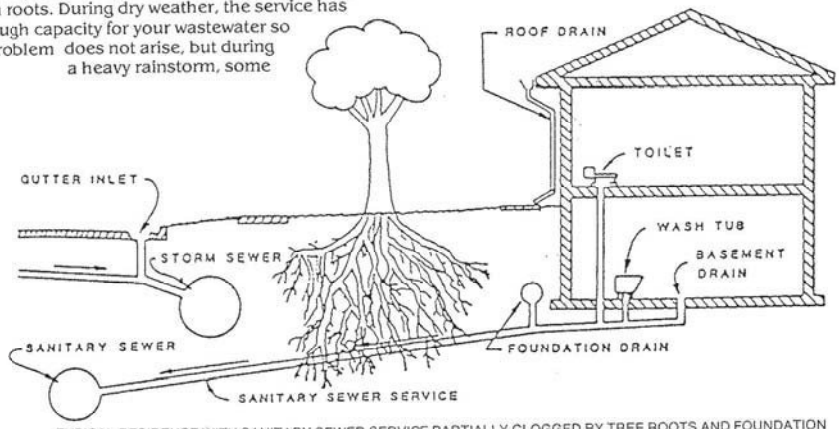
The storm water drainage system includes the storm water inlets in the streets, the storm sewer network, and Lacy, St. Joseph and Prentiss Creeks. The storm water drainage system is designed to collect and carry away the storm water runoff from the streets, driveways, roofs, and yards. The storm drainage systems are the responsibility of the local villages, the County, or special drainage districts.

III. Types of Backups and Their Problems

If you experience a backup during a rainstorm, it is probably caused by (A) a faulty private service pipe; or (B) an overloaded local sanitary sewer main in the street.

A. Faulty Private Service Pipe

The service line between your house and the District sanitary sewer may be broken or partially plugged with roots. During dry weather, the service has enough capacity for your wastewater so a problem does not arise, but during a heavy rainstorm, some storm water may be getting into your service and the extra water may exceed its restricted capacity which would cause the water to back up into your basement. If you experienced a backup but your neighbors with a similar basement and plumbing did not, this situation may be causing your problems.



TYPICAL RESIDENCE WITH SANITARY SEWER SERVICE PARTIALLY CLOGGED BY TREE ROOTS AND FOUNDATION DRAIN CONNECTED TO SANITARY SEWER SERVICE

FIGURE 1

Tree roots can become entangled in sewer lines, thus clogging pipes and causing sewer backup.

As the maintenance and repair of an individual building service is the responsibility of the building owner, the correction of a backup problem caused by roots or defective service pipes will be your responsibility. If your problem is caused by root blockage, it can be relatively easy and inexpensive to correct depending on which alternative action you choose. First, the sewer must be cleaned with an electric rodding machine using a root cutter that will thoroughly remove the roots that have grown into the pipe. Following that, the homeowner may elect to do the following:

1. **Periodic rodding** - Having the sewer rodded on a regular schedule to cut out all root growth will often be sufficient to keep them under control and reduce the likelihood of sewer backup. No rules can be given on how often this must be done because it depends on how active the roots are and how thorough a job the contractor is able to do. Some homeowners have found it necessary to have the sewer rodded as often as every six months, and others have found that once every few years is enough.

2. **Use of root remover products** - A number of root remover products are available commercially. Be sure to follow all of the manufacturer's instructions. Although these products may not completely eliminate the growth, they may increase the interval between needed rodding.

3. **Sewer pipe replacement** - The surest method of permanently correcting the problem is to have the sewer pipe dug up and replaced at the location where the roots are getting in. The new pipe used for replacement has a new type of joint that is tightly sealed to completely eliminate future entrance of roots. The sewer contractor or whoever performs the repair must be bonded with the Downers Grove Sanitary District and a Sewer Permit must be obtained from the District, at no charge. This is not, however, an inexpensive solution.

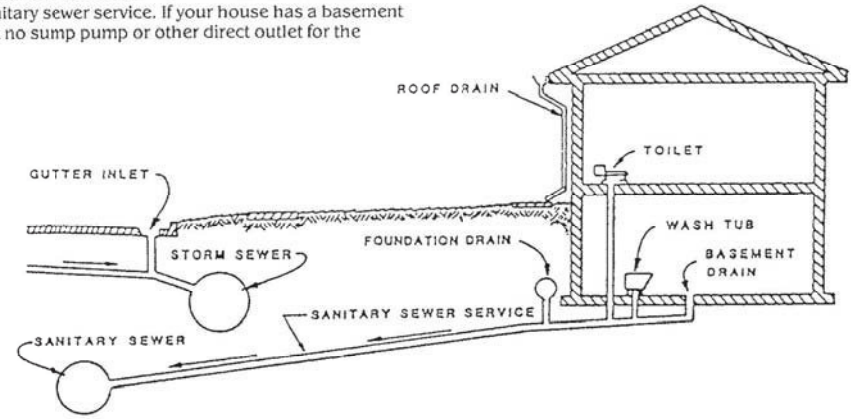
4. **Any ground water or storm water which enters the sanitary sewer, such as foundation drains, roof downspouts, or sump pumps must be removed from the sanitary sewer.** These types of connections are in violation of District ordinances and contribute significantly to the overloading of the sanitary sewer system.

Blockage of house sewers is also occasionally caused by broken or separated pipe. This is usually the result of soil settlement under the pipe or poor installation of the pipe. In these cases, there is little alternative than to dig up the pipe at the damaged location and make repairs.

A professional firm specializing in sewer repair can best advise on the type of blockage in a sewer, the location and the probability that it will recur. Before making any decision on how to proceed, we would strongly advise the homeowner to get more than one opinion (and cost estimate) on work needed to be done.

B. Overloaded Sanitary Sewer Main

The sanitary sewer main in the street may be overloaded during wet weather periods because the sewer system cannot handle the extra storm water that gets into the system. Much of the storm water gets into the system through plumbing connections that were made when the houses were first constructed, particularly the houses that were built prior to 1960. Prior to that time, it was common practice to connect the foundation drain to the sanitary sewer service. If your house has a basement but no sump pump or other direct outlet for the foundation drain, it is likely that your drains are directly connected to the sanitary sewers. Some houses have direct connections between the sanitary sewer service and the roof downspouts and/or an area drain. Each of these connections will contribute large amounts of storm water to the sanitary sewer system. **These connections are violations of District ordinances and must be disconnected.**



TYPICAL RESIDENCE WITH FOUNDATION DRAIN CONNECTED TO SANITARY SEWER SERVICE

FIGURE 2

If an overloaded sanitary sewer main is the cause of your sewer backup, your neighbors probably experienced similar problems. If so, you can either protect the contents of your basement and let the sewer continue to backup, or you can prevent the backups. If you want to simply protect the contents of your basement from damage, please refer to the tasks, warnings, advantages and disadvantages discussed in a subsequent section of this report. If you want to prevent the backups, several alternative procedures are available.

1. **Plugs or Standpipes:** Since the basement floor drain is the lowest opening to the sewer in your house, it is the first place of entry for the backup. The floor drain can be closed with a rubber plug or with a standpipe during heavy rainstorms. Some drains are specifically threaded for a screw-in plug or a standpipe. This is the simplest and least expensive way to stop backups through the drain, but it is effective only until the sewage level rises up to the level of the next opening, probably a shower, toilet, or sink. At that level, the sewage will overflow into your basement.

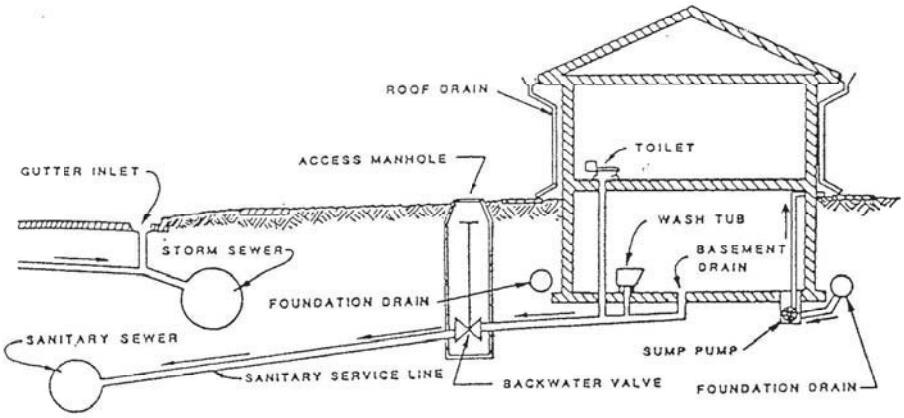
   If you use a plug or a standpipe, you must consider and protect against the possible uplift pressure on your basement floor. To be effective, a plug or standpipe confines the sewage to the pipes under the basement. If these pipes are watertight, the sewage won't leak out so no uplift presssure will develop. If the pipes are not watertight, the sewage will leak out of the pipes and saturate the ground beneath the floor. This sewage will then push up on your floor and if the pressure is large enough, your floor may buckle which would cause more damage than a basement backup. Since it is difficult to determine the condition of the pipes beneath your basement floor, plugs or tall standpipes should be used with caution. A "rule of thumb" which may be used as a guide is that a water level six inches higher than the basement floor level will not exert significant uplift pressure on the floor so, under normal conditions, a six-inch standpipe may reduce minor flooding without damage to the floor.

2. **Valve:** Since the sewer backup comes through the service line, an obvious solution is to install a valve in that line and to close that valve when flooding is imminent. The valve is normally installed in a manhole that is located outside the house where it is easier to install and maintain. Some valves are manual and others operate automatically such as a "check valve." The manual valves are not effective unless someone is available to close them. The automatic valves sometimes fail to close completely because sewage solids get jammed in the valve. In those cases, the valves may not prevent the backup.

When the valve is tightly closed, the sewage backup into the house is cut off, but the sewage flow from the house to the sewer is also cut off. Thus, the household plumbing cannot be used unless a pumped bypass is provided. Also, all storm water sources such as the foundation drain and roof downspout must be disconnected from the sanitary service, otherwise the storm water will back up into the basement through the floor drain. In addition, this connection is a violation of District ordinances.

Valves installed in sewer lines sometimes become "jammed" with debris and fail to close completely. In this case, the valve may slow down the backflow of sewage, but not stop it completely. For this reason, a valve installed on a sewer line should not be depended on for 100 percent protection, and an access manhole should always be provided for service and repair work.

A sanitary sewer permit, at no charge, is required from the District for this type of work.



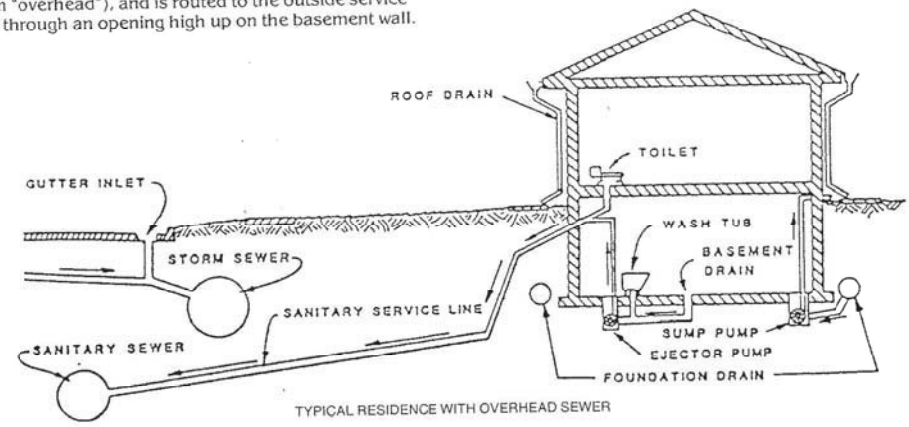
TYPICAL RESIDENCE WITH BACKWATER VALVE

FIGURE 3

3. **Overhead Sewer:** The term "overhead sewer" means that there are no direct openings to the sanitary sewer in the basement. All of the wastewater that is collected in the basement is discharged into a separate sump pit and pumped into the sanitary service line so the basement drainage is dependent on a pump and a continuous electric power supply. Generally, the plumbing from the fixtures on the main floor is installed just below the basement ceiling (hence, the term "overhead"), and is routed to the outside service line through an opening high up on the basement wall.

Converting your plumbing to an overhead sewer is one of the most expensive ways to prevent basement backups. Nevertheless, it is generally considered to be the best method available.

A sanitary sewer permit, at no charge, is required from the District for this type of work.



TYPICAL RESIDENCE WITH OVERHEAD SEWER

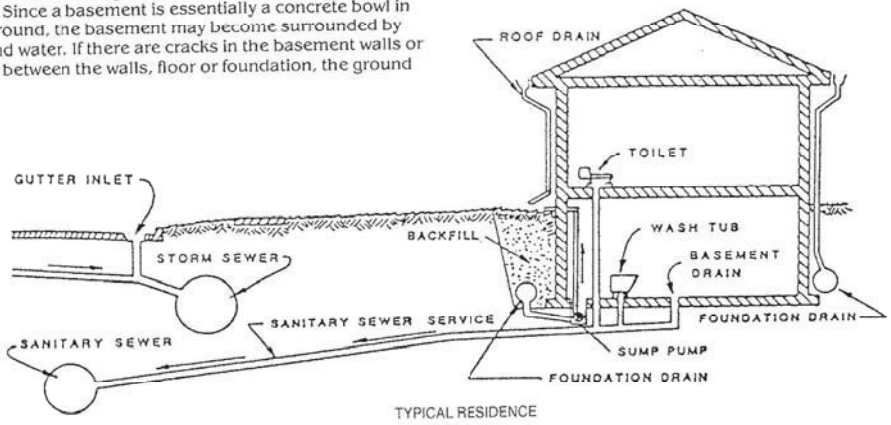
FIGURE 4

IV. Storm Water Flooding/Seepage

Apparent basement backups can be caused by ground water that enters the basement through cracks in the walls or through the basement sump or by storm water runoff flowing overland that enters the house through windows, doorways, or other openings.

Ground water is always present but the depth of the ground water is dependent on the soil type, ground surface elevation, surrounding topography and previous rainfall amounts. During rainstorms, some of the rainfall percolates into the ground which raises the ground water level. Since a basement is essentially a concrete bowl in the ground, the basement may become surrounded by ground water. If there are cracks in the basement walls or leaks between the walls, floor or foundation, the ground water will enter the basement. Minor leaks can be corrected by the careful application of special hydraulic cements, which must be applied in strict accordance with the manufacturer's recommendations to be effective.

At the base of most houses, there is a pipe that is laid all around the outside of the foundation. The pipe may be perforated or may have open joints so that the ground water can easily enter it. This foundation drain protects the house by draining the ground water away from the basement.



TYPICAL RESIDENCE

FIGURE 5

In many cases, the foundation drain is directly connected to the sump pump and all of the drainage must be pumped out of the basement.

Any flooding through the basement sump is either caused by: (1) a pump that does not work properly; or (2) by water entering the sump at a rate that exceeds the capacity of the pump. If you rely on a sump pump to keep water out of your basement, you may want to start a routine maintenance program to be sure that the pump will operate when needed. Such a program should follow the pump manufacturer's instructions. It could consist of:

1. Every month, pour some water into the pump to make sure that the pump operates and that it quickly empties the sump.
2. Every six months, check and clean the strainer on the suction side of the pump.

If the pump is working properly, the flooding could be caused by water entering the sump at a rate that exceeds the pump's capacity. The excess water floods the basement floor. The large amounts of water may be coming from the foundation drain, the roof downspouts, or both.

Grading - After construction of a house, the space around the basement is filled with backfill. In some cases, this backfill will settle, creating a low area adjacent to the basement walls. Any storm water runoff that gets into the low area will rapidly percolate down along the basement walls and will enter the foundation drain. This situation can be corrected by filling the low area with soil to create a slope away from the basement walls that will divert storm water runoff away from the basement and foundation drain.

Roof Downspouts - The roof downspouts can have a substantial impact on the flow from a foundation drain. In some cases, as shown on the right side of Figure 5, the roof downspouts are directly connected to the foundation drains. During an intense rainstorm, this type of downspout can discharge thousands of gallons of rainwater to the sump pit which can exceed the pump's capacity and cause basement flooding. To eliminate this problem, the downspout should be cut off above the ground surface and the drain pipe into the ground should be carefully sealed. An elbow and an extension should be installed on each downspout to direct the rainwater away from the basement. The extension should reach well beyond the old excavation.

If the existing downspout is not fitted with an extension as shown in the left side of Figure 5, the rainwater may collect near the basement wall and percolate directly to the foundation drain. To correct this situation, an extension should be installed on the elbow to direct the rainwater away from the basement walls.

If the house does not have roof gutters and downspouts, the rainwater falls directly off the roof and percolates along the basement wall. To correct this situation, gutters and downspouts with extensions will prove beneficial.

The importance of proper grading and proper discharge of the roof downspouts cannot be over-emphasized and the problems can be alleviated by simple measures performed by the homeowner.

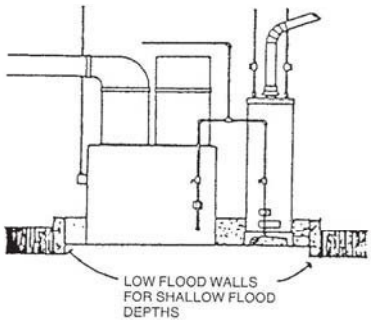
Overland Flow - Storm water flooding can be caused by water runoff that exceeds the capacity of the drainage system. The excess runoff flows overland and enters houses through windows, doors, or other openings. Generally, this type of flooding is more difficult and expensive to prevent than the flooding by ground water that was discussed above.

Basement flooding, caused by storm water runoff or seepage, is not a sanitary sewer backup. Flooding problems should be directed to your local village or other agency responsible for the storm drainage system in your area.

V. How To Minimize Damage From Backups

If it is impossible or prohibitively expensive to prevent a backup in your house, the damages can be minimized by measures aimed at protecting the house and its contents.

There are five main tasks to protect your house to reduce sewer backup damage. (These tasks may also help protect your home from flooding caused by storm water runoff or seepage.)



1. Relocate expensive items that are subject to water damage. Freezers, washers, dryers, furniture, power tools, large appliances and similar items should be permanently moved to higher floors.
2. Protect what cannot be moved. A floodwall or protection closet could be built around valuable, immovable equipment. Such protection walls must withstand all the pressure caused by the flood waters.

   Another alternative is to place the equipment on a pedestal above the flood height. Some equipment can be protected by a coating of grease or covering with plastic bags or plastic sheets.
3. Relocate or adjust your utilities. Either move all electric outlets above the flood level or install a control panel where the power can be shut off easily in time of flood. If your furnace, water heater, dryer, and other gas appliances are not all elevated, make sure there is an accessible gas shut-off valve.
4. Seal off the sewer and water systems to prevent health hazards caused by interflows with flood waters. A water heater moved to an attic can act as an emergency storage tank for a gravity-fed potable water supply. Heating and air conditioning ducts should have removable plugs along the bottom to permit water to drain out when the flood recedes.
5. Store things that are very quick to remove or items that won't be damaged; garden tools, metal furniture or cabinets, spare tires, boats, or floatable items (if water is shallow), plastic curtains, etc.

If you rebuild or improve the floodable area, use the following types of materials:

Concrete, concrete block or glazed brick; clay, concrete or ceramic tile; mastic, silicone or polyurethane formed-in-place flooring; terrazzo, rubber, vinyl or vinyl-asbestos floor covering with waterproof adhesives; stone, slate or cast stone (with waterproof mortar); glass or glass block; metal doors and window frames; foam or closed cell type insulation; polyester-epoxy or other waterproof type paint; indoor-outdoor carpeting (be able to remove it so the debris can be hosed out of it).

Do not use the following types of materials because they dissolve and decompose when wet or they absorb and retain too much water:

Wood, chipboard; gypsum products; cork; fabrics, carpeting, felt based floor coverings; linoleum; fiberboard, paperboard, strawboard; batt, blanket, and other types of insulation; wallpaper.

Certain items should not be stored in the floodable area because they would become especially hazardous or create health or pollution problems during a flood:

- Hazardous chemicals: chlorine, fluorine, acids, sulfur products, magnesium, many industrial chemicals.
- Hazardous household products: lye, pesticides, poisons, calcium hypochlorite (swimming pool chlorine), bleach, ammonia, lime detergents.
- Charcoal, coal, coal dust, coke, and hay are subject to spontaneous combustion when wet or moist.
- Gasoline, acetone, benzyne.
- Drugs, food (unless in tin cans).
- Storage tanks and buoyant materials can float and cause damage to walls, ceilings, and other contents.

Finally, here is a list of products that are particularly subject to flood damage. They should be removed, if possible, from any flood-prone areas as an extra precaution:

Appliances, clocks and other electric motors; art works, musical instruments; books, magazines, papers; clothing, curtains; televisions, radios, electronic equipment; upholstered furniture, mattresses; cabinets, pool tables, and similar wood furniture that would become useless with only a little warping.

Never enter a flooded basement unless absolutely necessary, and then only with extreme caution. The possibility of electrocution is always present. Always wear rubber boots. When cleaning the basement after water has receded, use caution around electrical outlets and appliances, and disconnect power from electrical equipment as quickly as possible.

VI. Cleaning Up Following A Backup

Shovel out any mud and debris while it is still moist and hose down the walls to remove silt. To get rid of any odor that may accompany a backup, scrub all interior wetted surfaces. Use hot sudsy water followed by double strength sanitizing solution, or use a household disinfectant, following manufacturer's directions. Repeat scrubbing and rinsing if necessary. You may also try sprinkling liberally with baking soda. Odors in the basement may be harder to treat. If the above approaches don't work, sprinkle bleaching powder (chlorine or lime) over the floor. Let it dry then sweep it up. Remember, bleaching powder is caustic and poisonous. Follow all the precautions on the label.

Wooden floors dry very slowly. Assuming your furnace is operational, keep the house at 60-70 degrees F. to hasten drying but don't overheat the house as this could cause cracking or splitting. All loose plaster should be removed because plaster board and drywall can be ruined if immersed for a long time. Removal will also speed drying of the walls and will enable you to inspect the insulation in the exterior walls. Any waterlogged insulation must be replaced.

Mildew may appear if a warm spell follows a flood. Scrub mildewed floors or woodwork with a mild alkali solution such as washing soda or tri-sodium phosphate (four to six tablespoons to a gallon of water). Badly stained walls will need new paint.

All electric motors that have gotten wet should be disconnected and thoroughly cleaned to get rid of dirt and grit. After cleaning, the motors should be re-oiled and allowed to dry for two weeks. You can shorten the drying time by using a fan or hair dryer.

Washers should be sanitized by pouring a disinfectant such as chlorine, pine oil, or phenolic into the empty washing machine, and then complete a 15-minute cycle at the hot setting. The dryer can be cleaned by wiping the drum with a cloth dipped in a disinfectant solution, rinse with cloth dipped in clear water. Leave washer and dryer doors open, preferably overnight, until all parts are dry.

Clothing, sheets, etc., should be hosed or rinsed with cool water to get as much mud out as possible. Then wash with as much detergent as possible. Bleach or other disinfectant should be used to kill bacteria. After drying, rugs and carpets can be cleaned with a vacuum cleaner and then shampooed.

Gasoline engines need to be thoroughly inspected and cleaned. All electrical parts must be dry. Grit or silt must be removed from the oil, transmission or gas lines.

VII. Summary

Problems which cause the sanitary sewers to occasionally back up are many and they are often interrelated. Many residents of the District may be worried and inconvenienced by the occurrence of a sewer backup in their basement or crawl space. It is our hope that if you have such a problem, you have found some suggestions in this report which may be of help. If you have a question regarding the connections in your home, call our office at 969-0664 during our regular business hours, 8:00 A.M. to 4:30 P.M., Monday through Friday.

In conclusion, please remember that the District's telephone number, 969-0664, is manned 24 hours a day, seven days a week, in the event you must contact the District to report a sanitary sewer backup or other emergency. **Call this number as soon as the backup occurs and before you call a plumber.** District personnel will respond as promptly as possible. If the backup is caused by a blockage located in the public sewer main, the problem will be corrected. If, however, the backup is caused by an overloading of the public sewer main during a rainstorm, the problem cannot be relieved and your backup will not recede until the rainstorm stops and overloading of the sewer main subsides, which may take several hours. If the backup is caused by a blockage in your private service lines, you must take appropriate measures to eliminate the problem.

DOWNERS GROVE SANITARY DISTRICT
REIMBURSEMENT PROGRAM FOR SANITARY SEWER BACKUPS
CAUSED BY PUBLIC SANITARY SEWER BLOCKAGES

LIST OF CONTRACTORS

Brouwer Brothers Steamatic	708/396-1447
Great Lakes Restoration, Inc.	630/685-4500
Servicemaster Disaster Services	800/954-9444

The District is providing this list as a service only. It is not an endorsement or recommendation of the contractors.

You are cautioned to review all of the requirements for reimbursement under the District's program. Prior to contacting a contractor, your attention is specifically directed to the program requirements relating to work to be performed including:

a) You must obtain two proposals for any work to be performed and reimbursement is limited to the amount of the lowest proposal.

b) Detailed paid invoices for all work performed are also required. Be sure you understand and the contractor details what services are included and provides a breakdown of all costs.

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Downers Grove
Sanitary District

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COST REIMBURSEMENT PROGRAM FOR THE INSTALLATION OF OVERHEAD SEWERS OR BACKFLOW PREVENTION DEVICES

The Downers Grove Sanitary District provides a Cost Reimbursement Program for the Installation of Overhead Sewers or Backflow Prevention Devices. If you are interested in this important program, carefully review the enclosed material which includes the following:

- Application for Participation
- Summary Outline
- Program Requirements – Overhead Sewer Program
- Agreement – Overhead Sewer Program
- Program Requirements – Private Property Infiltration and Inflow Removal Program
- Agreement – Overhead Sewer Program and Private Property Infiltration and Inflow Removal Program
- Building Sanitary Service Access Agreement
- Sanitary Sewer Backup Handbook

This program has been implemented as a part of the District's ongoing efforts to reduce infiltration and inflow of storm water into the sanitary sewer system. During periods of heavy rainfall, infiltration and inflow of storm water overloads the sanitary sewer system and contributes to sanitary sewer backup problems. The District will continue to address sanitary sewer backup problems through an aggressive sanitary sewer maintenance and rehabilitation program. However, despite the District's efforts, sanitary sewer backups can occur and residents should consider installation of overhead sewers or backflow prevention devices.

After review of the enclosed material, please call our office if you have any questions or need any additional information. If you would like to participate in this program, please complete and return the one page Application for Participation form.

Member Illinois Association of Wastewater Agencies
Printed on Recycled Paper

APPLICATION FOR PARTICIPATION IN DOWNERS GROVE SANITARY DISTRICT COST REIMBURSEMENT PROGRAM FOR THE INSTALLATION OF OVERHEAD SEWERS OR BACKFLOW PREVENTION DEVICES AND PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL PROGRAM

I/We hereby request participation in the Downers Grove Sanitary District Cost Reimbursement Program for the Installation of Overhead Sewers or Backflow Prevention Devices ("Overhead Program"), and the Private Property Infiltration and Inflow Removal Program ("I/I Program").

I/We own, and this application is for, the following described property:

Address: _____
_____

Legal Description: _____
_____
_____
_____

P.I.N.: _____

I/We have received copies of the Program Requirements for the Overhead Program and the I/I Program attached to and made a part of this application.

I/We agree to allow the Downers Grove Sanitary District or its representatives to make any and all inspections and testing as detailed in the Program Requirements.

I/We have received the Agreement for Cost Reimbursement Program for the Installation of Overhead Sewers or Backflow Prevention Devices and for Private Property Infiltration and Inflow Removal, and the Building Sanitary Service Access Agreement, and understand that said Agreements must be signed upon notice of preliminary approval as detailed in the Program Requirements.

Dated this _____ day of _____, _____.

_____ _____
Printed Name Signature

_____ _____
Printed Name Signature

_____
Phone Number

_____
_____
Mailing Address

DOWNERS GROVE SANITARY DISTRICT
COST REIMBURSEMENT PROGRAM
FOR THE INSTALLATION OF OVERHEAD SEWERS
OR BACKFLOW PREVENTION DEVICES

SUMMARY OUTLINE

1) Owner submits completed Application for Participation.
2) District performs initial inspection of the building.
3) District performs second inspection of the building, including inserting a small television camera into the building sanitary service pipe from inside the building and injecting water into the ground in the area over this pipe on the outside of the building to identify and locate any leaks.
4) District issues a Notice of Eligibility or Noneligibility for the Overhead Sewer Program and issues written findings of the inspections.
5) If Owner receives a Notice of Eligibility, the Owner has six months from the date of the Notice to submit the required information.

6A) If there are no infiltration and inflow (I/I) sources eligible for removal under the Private Property I/I Removal Program, the Owner obtains at least two proposals from contractors and submits the proposals to the District.

7A) Upon receipt of all required information, the District issues preliminary approval and sends to the Owner for signature the Program Agreement, Building Sanitary Service Access Agreement and the selected contractor proposal. Owner must return signed Agreements and signed proposal within thirty days of the date of the preliminary approval.

8A) Upon submittal to the District of the signed Agreements and signed proposal with selected contractor, Owner and contractor must obtain all permits, complete the work, request inspection by the District and the building authority, and submit paid receipt within six months of the date of the preliminary approval.

9A) Upon acceptance, the District pays the Owner for the appropriate portion of the overhead sewer work.

10A) If owner fails to comply within any of the allotted time frames detailed above, funding priority ceases and Owner must submit new Application for Participation and such application will be treated as a new application for determination of funding eligibility.

6B) If there are infiltration and inflow (I/I) sources eligible for removal under the Private Property I/I Removal Program, the District assists the Owner in obtaining proposals from contractors and selecting the lowest, responsible proposal.

7B) Upon receipt of all required information, the District issues preliminary approval and sends to the Owner for signature the Program Agreement, Building Sanitary Service Access Agreement and the selected contractor proposal. Owner must return signed Agreements and signed proposal within thirty days of the date of the preliminary approval.

8B) The Owner signs and returns to the District the Program Agreement, Access Agreement and contractor proposal. The Owner schedules the work with the contractor.

9B) The contractor completes the work. The District inspects the work and performs any appropriate testing. The Village also inspects the work.

10B) Upon acceptance, the Owner pays the contractor for the appropriate portion of the overhead sewer work and the District pays the contractor for the appropriate portion of the overhead sewer work and for the eligible I/I removal work.

11B) If Owner fails to comply within any of the allotted time frames detailed above, funding priority ceases and Owner must submit new Application for Participation and such application will be treated as a new application for determination of funding eligibility.

APPROVED AUGUST 1997
REVISED OCTOBER 2001
REVISED APRIL 2005

DOWNERS GROVE SANITARY DISTRICT
COST REIMBURSEMENT PROGRAM
FOR THE INSTALLATION OF OVERHEAD SEWERS
OR BACKFLOW PREVENTION DEVICES

PROGRAM REQUIREMENTS

The District will provide funds to building owners who have or may experience sanitary sewer backups during periods of heavy rainfall for the installation of overhead sewers or backflow prevention devices.

The District has determined that certain requirements for the cost reimbursement program are necessary to protect the District's sanitary sewer system, the integrity of such a program and the financial well-being of the District.

A cost reimbursement program for the installation of overhead sewers or backflow prevention devices is hereby implemented in accordance with the following requirements:

1) The District will reimburse an owner up to $3,000, or 50% of the cost, whichever is less, of installing a District approved overhead sewer system or backflow prevention device.

2) The program applies to all buildings connected to the Downers Grove Sanitary District collection system and constructed prior to July 17, 1996.

3) The program shall apply to installaions of overhead sewers or backflow prevention devices made on or after July 17, 1996.

4) Financial participation of the District is limited to funds budgeted for the program. Said funding level may be changed or eliminated based on the District's annual review of the program.

5) Applications will be classified into the following priority groups for purposes of determining funding eligibility.

a) First priority - One or more sanitary sewer backups have occurred at the building and been reported to the District. The owner must provide documentation of previous sanitary sewer backups. Prior reports of sewer backups to the District, either by telephone at the time of the backup or by

submittal of a Sanitary Sewer Backup Report shall constitute adequate documentation of a sanitary sewer backup.

Upon initial approval of the program, the District will mail a notice of availability of the program to all users who reported a backup during the July 17-18, 1996, or February 21, 1997, storm events. Thereafter, and for as long as the program remains in effect, the District will notify all users who report backups of the availability of the program.

b) Second priority - The following applications will be classified as second priority:

1. Any building which has the potential to experience sanitary sewer backups as a result of an insufficient elevation differential between the building's internal plumbing and the District's sanitary sewer system. No sanitary sewer backups have occurred at the property, but the owner is desirous of installing an overhead sewer or backflow prevention device as a preventive measure.

2. A building for which the overhead sewer or backflow prevention device was installed from July 17, 1996, to the date of approval of this policy.

3. At least one reimbursement has been made for the building and the application is a second or succeeding request for reimbursement for the same building.

Between May 1 and the following February 28 of each fiscal year, applications from the first priority group will be funded on a first come, first served basis within available budget limitations. If budget funds remain, on March 1, applications from both priority groups will be funded between March 1 and April 30 of each fiscal year on a first come, first served basis within available budget limitations. Applications not funded in a fiscal year will be carried over to the next fiscal year and funded in accordance with the above procedures.

6) An owner desiring to participate in this program must complete the following steps:

a) Owner submits a complete and signed Application for Participation form.

b) District inspects the building, as described in the Program Requirements for the Private Property Infiltration and Inflow Removal Program, and issues a notice of eligibility or noneligibility to the owner. Said notice may include the sources or potential sources of infiltration and inflow which must be removed as a requirement of this program.

c) Upon receipt of a notice of eligibility from the District, the owner obtains proposals from contractors as described in Item 13. If the owner does not submit all of the required information within six (6) months of the date of the notice of eligibility, the owner must resubmit an application for participation form and such application will be treated as a new application for determination of funding eligibility.

d) District reviews proposals, provides owner with preliminary approval, and provides agreements for owner signature. Owner must return signed agreements and signed proposal with selected contractor within thirty (30) days of the date of the preliminary approval.

e) Owner and contractor obtain all permits and complete the work.

f) Upon completion of the work, premises are inspected by the District and the appropriate building authority. Upon approval by the District and the appropriate building authority, acceptance by the owner, and submission of a paid receipt from the contractor to the owner, reimbursement will be made directly to the owner. (The owner is also encouraged to obtain an appropriate waiver of lien from the contractor for the owner's protection.) Said reimbursement will be made in the District's normal course of business.

g) Owner must complete the items described in Items e and f above within six (6) months of the date of the preliminary approval described in item d above, or the funding commitment shall be withdrawn and the owner must reapply and such application will be treated as a new application for determination of funding eligibility.

7) Owners of the building where the overhead sewer or backflow prevention device is installed must execute an agreement which includes a clause whereby the Owners release and waive any claim of liability against the District from any previous sanitary sewer backups or any consequence of the selection of the system to be installed, the contractor to be utilized, installation of the system, operation or maintenance of the system once it is installed, or the eligibility, participation or funding priority in this program.

If a backflow prevention device is installed, the District will record a memorandum of the agreement against the property. Said memorandum shall serve as notice that a backflow prevention device has been installed on the property which requires maintenance for proper operation.

8) No owner shall be eligible for participation unless the owner and the building where the overhead sewer or backflow prevention device is or has been installed are in compliance with all District ordinances, including but not limited to payment of all fees and charges due to the District.

9) An owner shall be eligible for participation more than once for the same property, however, in no case, shall the total reimbursement from the District for any one property exceed the limits prescribed in paragraph 1 above.

10) The program will be evaluated annually and the District may change or eliminate the program.

11) The owner must comply with the District's Private Property Infiltration and Inflow Removal Program.

12) The program is limited to the actual cost of the overhead sewer or backflow prevention device installation, subject to the funding limitations contained herein, but does not include incidental costs such as landscape restoration, painting, tile, carpeting, etc.

13) The owner must provide the District with proposals from a minimum of two contractors (three proposals are recommended) for the type of backup prevention selected by the owner prior to authorizing the work. If the desired backup prevention is not an overhead sewer, a proposal for an overhead sewer conversion must also be submitted. An overhead sewer does not rely upon a backflow valve or device and is believed to be the best backup prevention method. All proposals must provide sufficient detail for the District to determine the exact method of installation, the costs for labor and materials, the portion of the work not eligible for this program under item 12 above, and compliance with all District ordinances and conditions, including this program.

14) The owner must obtain a no-charge District sewer permit for the work and must obtain a permit from the appropriate building authority (i.e., municipality or county), if required. After issuance of the permits, any changes or modifications to the work will require review and approval of the District and the appropriate building authority.

15) The contractor hired by the owner to perform the work must be bonded with the District, and the appropriate building authority, if required.

16) The District is not a party to any contract between the owner and the contractor.

17) In order to be eligible for this program, the installation of an overhead sewer shall meet the following requirements:

a. Overhead sanitary sewers must be provided to all floor levels that are less than one foot (1') above the elevation of the rim of the District manhole immediately upstream of the point of connection of said building into the District sanitary sewer system. Plumbing fixtures on a building floor level below an overhead sewer shall drain into an ejector pit. The elevations described above shall be included in the contractor's proposal.

b. A properly vented ejector basin shall be installed for all installations under this program. Ejector basins must comply with all District and appropriate building authority requirements. Ejector basins must be at least ten (10) feet from any storm water sump pits. The District shall maintain a list of ejector basins approved for use under this program.

c. The manufacturer and model number of the proposed ejector pump must be specified in the contractor's proposal. The pump curve for the proposed ejector pump must be provided with the contractor's proposal. All ejector pumps must be able to pass a two inch solid. The smallest capacity pump suitable for the proposed installation must be specified. The capacity of the ejector pump shall not exceed 89 gallons per minute at a total head of ten feet. The ejector pump must be selected and installed in accordance with the manufacturer's requirements.

d. Connections to the proposed ejector pump must be specifically listed on the contractor's proposal and all such connections shall be for the disposal of sanitary wastes only.

e. A sketch indicating the proposed work must be included with each proposal.

f. The District shall have the right to enter the building for inspection upon completion of the work and to impose penalties if the capacity of the ejector pump exceeds the capacity allowed by item c. above. All such penalties shall be imposed in accordance with District ordinances prescribing penalties for ordinance violations as may be in effect at the time the violation of this section is discovered.

18) All work under this program must comply with District and applicable municipal or county ordinances, codes and requirements. In the event of any conflict between the District and municipal or county ordinances, codes or requirements, the District shall prevail.

19) The owner may elect to proceed with the work even though funding is not available. Reimbursement will be made when budgeted funds become available in

accordance with this program. Such installations must comply with all requirements of this program in order to be eligible for future reimbursement.

20) The General Manager may, in his discretion, provide a waiver of those program requirements listed above which he deems appropriate based on his evaluation of the individual circumstances related to a request for reimbursement.

21) The District shall have the sole authority to determine eligibility for participation, prioritization of requests and compliance with all District ordinances.

SAMPLE – DO NOT SIGN AT THIS TIME

AGREEMENT FOR COST REIMBURSEMENT PROGRAM
FOR THE INSTALLATION OF OVERHEAD SEWERS OR BACKFLOW PREVENTION DEVICES

This Agreement is made this ___ day of _____, _____, by and between the Downers Grove Sanitary District ("District") and _____ _____ ("Owners") of the premises located at:

Address: _____
_____

Legal Description: _____
_____
_____
_____

P.I.N.: _____

Whereas, the District has a cost reimbursement program for the installation of overhead sewers or backflow prevention devices ("Program"), and

Whereas, Owners desire to participate in the Program.

Now, therefore, in consideration of the mutual covenants contained herein, the District and the Owners hereby agree to the following terms and conditions:

1) Owners have read and understand the program requirements attached to and made a part of this agreement.

2) Upon compliance of Owners with all terms and conditions as stated in the program information, the District will provide a reimbursement to the Owners as allowed by the program.

3) Owners agree to release and waive any claim, suit or liability and to indemnify and hold harmless the Downers Grove Sanitary District, its trustees, officers, employees, engineers and agents, from and against all liability, damage, loss, claims, demands and actions of any nature whatsoever which arise out of or are connected with, or are claimed to arise out of or be connected with any previous sanitary sewer backups or the undersigned's participation in this program. This covenant shall include, but not be limited to, any consequence of the inspection of the premises, selection of the system installed or the contractor utilized, installation of the system, operation, maintenance or failure of the system once it is installed, or eligibility for, participation in or funding priority in the Program.

4) Owners state that they are the owners of the premises listed above, that they have read and understand this Agreement, and that they have signed this Agreement as their free and voluntary act.

5) A memorandum of this agreement will be recorded with the DuPage County Recorder of Deeds. This memorandum shall serve as notice to future property owners that a backflow prevention device has been installed on the property and that the backflow prevention device requires maintenance to insure proper operation.

DOWNERS GROVE SANITARY DISTRICT OWNER(S)

_____ _____

Lawrence C. Cox, General Manager

_____

SAMPLE – DO NOT SIGN AT THIS TIME

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

I, the undersigned, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that _____, personally known to me to be the same persons whose names are subscribed to the foregoing instrument appeared before me this day in person and acknowledged that they signed and delivered the said instrument as their own free and voluntary act for the uses and purposes therein set forth.

GIVEN under my hand and official seal this _____day of _____, 20___.

_____
Notary Public

Prepared By: Michael C. Wiedel, 4915 Main Street, Downers Grove, Illinois 60515

APPROVED MAY 2001
REVISED OCTOBER 2001

DOWNERS GROVE SANITARY DISTRICT
PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL PROGRAM

PROGRAM REQUIREMENTS

BACKGROUND

District ordinances prohibit the discharge of any stormwater, surface water, ground water, roof runoff water, sub-surface drainage, runoff water from ground or paved areas, cistern overflow or any flows other than wastewater into the District sanitary sewer system. These flows, referred to as infiltration and inflow or I/I, overload the sanitary system, resulting in the backup of raw sewage into basements and the overflow of raw sewage from manholes. Infiltration and inflow (I/I) can be contributed from private property through direct footing drain connections, indirect footing drain connections, sump pumps, downspouts or roof drains, driveway drains, area drains, patio or yard drains, leaking sanitary or ejector sump pits, leaks in subsurface sanitary waste piping or the building sanitary service, etc. In 1973, the District began inspecting buildings to identify downspout and sump pump connections which contributed I/I to the sanitary sewer system. Property owners were requested to correct any downspout or sump pump connection which contributed I/I and these corrections have been completed at the property owner's expense. A copy is attached of those sections of District ordinances which prohibit the discharge of I/I into the sanitary sewer system, provide for District inspections to identify such sources and require the correction of any such illegal connections.

Unfortunately, the District sanitary sewer system continues to receive high levels of I/I. Normal flows to the District Wastewater Treatment Center during dry weather average 8 million gallons per day. During significant rainfall or snow melting events, these flows reach peak flow rates in excess of 80 million gallons per day. The majority of these I/I flows are coming from private property. As a result, in order to reduce I/I, the District must now identify and correct the remaining I/I sources, such as direct footing drain connections, indirect footing drain connections, driveway drains, area, patio or yard drains, and leaks in subsurface sanitary waste piping or the building sanitary service. These sources have not previously been addressed because of the cost of identification and correction. The District developed this Private Property Infiltration and Inflow Removal Program to address these I/I sources.

PROGRAM REQUIREMENTS

The District will provide assistance to property owners to identify and remove infiltration and inflow sources located on their property as detailed in this program. This program is being implemented to recognize that the removal of infiltration and inflow from the District sanitary sewer system benefits all users of the system and, therefore, the costs of this removal should be borne by all users as a system cost. This program will also provide a mechanism to insure that this work is performed properly and in a manner which protects the integrity of the District sanitary sewer system.

The District has determined that certain requirements for the Private Property Infiltration and Inflow Removal Program are necessary to protect the integrity of such a program and the financial well being of the District.

A private property infiltration and inflow removal assistance program is hereby implemented under the following conditions and requirements:

1) The following I/I sources are eligible for removal under this program: direct footing drain connections, indirect footing drain connections, driveway drains, area drains, patio or yard drains, leaking plumbing waste lines, or leaks in subsurface sanitary waste piping or the building sanitary service. The following I/I sources are not eligible for removal under this program and must be removed at the owner's sole expense: sump pumps, downspouts, or roof drains.

2) This program applies to all buildings connected to the Downers Grove Sanitary District sanitary sewer system which meet one of the following criteria:

   a) Building is located within an area selected by the District for infiltration and inflow removal.

   b) Building owner has applied for the District Cost Reimbursement Program for the Installation of Overhead Sewers or Backflow Prevention Devices.

3) This program shall be effective June 4, 2001.

4) The program will be evaluated annually and the District may change or eliminate the program.

5) This program is limited to funds budgeted for the program. Funding levels may be changed or eliminated based on the District's annual review of the program.

6) Prioritization of applications shall be at the sole discretion of the District. For purposes of prioritizing applications, the District may consider the severity of the I/I flows, costs for corrective measures, time constraints, and such other considerations as the District deems necessary.

7) An owner desiring to participate in this program must sign an Agreement for Private Property Infiltration and Inflow Removal (hereinafter referred to as the "Program Agreement") and a Building Sanitary Service Access Agreement (hereinafter referred to as the "Access Agreement"). Said Program Agreement shall include, among other items, a clause whereby the Owner releases and waives any claim of liability against the District from any consequence of their participation in the program including, the District's determination of corrective actions, selection of the contractor to be utilized, implementation and completion of the corrective action, or the owner's eligibility, participation or funding priority in this program.

8) The District will pay for the costs of identifying and removing all eligible I/I sources, including testing; televising; installation of storm water sump pits, pumps and piping; disconnection of existing drains from the sanitary sewer and connection to a storm water sump or piping; repair, rehabilitation or replacement of subsurface sanitary waste piping or the building sanitary service, and reasonable restoration. The installation of a footing tile drainage system is not eligible for assistance under this program.

9) The property owner retains ownership and operation, maintenance and replacement responsibility for all sump pumps, piping, connections and appurtenances which may be installed under this program. Nothing contained in this program shall transfer ownership or operation, maintenance or replacement responsibility for these facilities to the District.

10) The property owner retains ownership and maintenance responsibilities for the building sanitary service serving the subject property and nothing contained in this program shall transfer ownership or maintenance responsibilities of the building sanitary service to the District.

11) The District's assistance is limited to the actual costs incurred for the eligible work contained in this program.

12) This program includes the following steps:

   a) Letter is sent to property owner explaining the program and requesting that the owner schedule the preliminary inspection of the building.

   b) District personnel conduct preliminary inspection of building, take measurements, interview owner, complete inspection form, and take photos or videos, as appropriate. District schedules date for second inspection with the owner.

   c) District conducts second inspection including televising and locating all subsurface sanitary waste piping and the building sanitary service, dye testing all outside drains and any suspect downspouts, and performing flood and/or dye test to ascertain leaks and footing tile.

   d) Based upon review of all data, the I/I quantity from each source is estimated and a cost-effective rehabilitation method is developed by the District.

   e) The District provides the owner with written findings of the inspections, the recommended rehabilitation method(s) and the eligibility of these methods under this program. These items are reviewed and discussed with the owner during a follow-up site visit.

f) The District schedules site visits with the owner and appropriate contractors to review the proposed work and to assist the contractors in the preparation of proposals for the completion of the recommended repairs.

g) The District receives proposals from contractors, evaluates each proposal and selects the lowest, responsible proposals for the work.

h) The District prepares and sends to the property owner for signature the Program Agreement and the Access Agreement.

i) The property owner signs and returns to the District the Program Agreement and the Access Agreement. The District schedules the work with the owner and the contractors.

j) The contractors complete the work. The District inspects the work and performs any appropriate testing. The Village also inspects the work.

k) Upon acceptance, the District pays the contractors for the work.

13) The General Manager may, in his discretion, provide a waiver of those program requirements listed above which he deems appropriate based on his evaluation of the individual circumstances.

14) The District shall have the sole authority to determine eligibility for participation, prioritization of requests and compliance with all requirements for the program and District ordinances.

EXCERPT FROM DISTRICT ORDINANCES

ARTICLE II - USE OF PUBLIC SEWERS

Section 4. No person shall discharge or cause to be discharged into the sanitary sewer system any storm water, surface water, ground water, roof runoff water, sub-surface drainage, runoff water from ground or paved areas, cistern overflow or water from air-conditioning systems, industrial cooling operations, or any flows other than wastewater.

Section 4.1. The proper maintenance and operation of a building sanitary service to and including the point of connection (such as a wye, tee or break-in connection) to the public sanitary sewer shall be the responsibility of the owner of the premises served by said building sanitary service. Maintenance means keeping the building sanitary service in satisfactory working condition and a good state of repair (including but not limited to preventing any obstruction or extraneous material or flows from entering said facilities, protecting said facilities from any damage and keeping same free from defects or malfunctions), and making necessary provisions and taking necessary precautions to assure that said sanitary sewer facilities are at all times capable of satisfactorily performing the services and adequately discharging the functions and producing the final results and purposes said facilities are intended to perform, discharge or produce. The District may, in its sole discretion, make repairs to any portion of a building sanitary service located within a public right-of-way or public easement which is found during District investigations to allow the entry of extraneous materials or flows into the public sanitary sewer or to pose a health or safety hazard to the general public and the District may seek reimbursement for the costs of any such repairs from the owner of the premises served by said building sanitary service.

Section 4.2. All downspouts or roof drains shall discharge onto the ground or be connected to storm sewers, drainage ditches or storm drainage systems. Footing drains shall be connected to sump pumps and discharge shall be made into storm sewers, drainage ditches or storm drainage systems. Sump pumps installed to receive and discharge ground waters or other storm water shall be connected to storm sewers or discharge onto the ground or into a drainage ditch or storm drainage system through a rigid discharge pipe, without any valving or quick connections for altering the path of discharge. Sump pumps installed to receive and discharge floor drain flow, laundry tubs or other wastewater shall be connected to the sanitary sewers pursuant to this ordinance. A sump pump shall be used for one function only, either the discharge of storm waters or the discharge of wastewater.

Section 4.3. The Manager shall cause to be made periodic visual outside inspections of all properties within the District, with specific attention to downspouts, roof drains and other visible or outside connections and shall request the property owner or property occupant to permit entry into the premises for the making of additional inspection of the premises to ascertain if illegal connections are present. Upon completion of the visual outside and inside inspection, the Manager will advise the property owner, in writing, if any illegal connections are observed, and will advise on the matter of corrections for compliance with the provisions of this ordinance. If corrections are to be made, the District will, at no expense to the owner, make further inspection of the corrections to insure compliance with this ordinance.

Section 4.4. If entrance to property is denied an employee or agent of the District, the Manager shall serve notice requiring, within a period of 30 days, a written affidavit by a Licensed Professional Engineer that the sanitary sewer system of the subject property complies in all respects to the requirements and specifications of this ordinance and that no storm water, surface water, ground water, roof runoff water, sub-surface drainage, runoff water from ground or paved areas, cistern overflow or water from air-conditioning systems, industrial cooling operations, or any flows other than wastewater are discharged into the sanitary sewer system from the subject property. In the event the property owner fails to provide the aforementioned affidavit within 30 days, the Manager shall commence action to terminate sanitary sewer service to the property remaining in non-compliance.

Section 4.5. In the event any property is in non-compliance with the provisions of Subsection 4.3 or 4.4 after the 30 day notice, that property shall be deemed continuing in non-compliance until there is paid to the District a sum in United States currency equal to all costs incurred by the District, including but not limited to clerical costs, mailing costs, service fees, attorneys fees, court costs, and all other reasonable fees and expenses incurred in commencing action to terminate the sanitary sewer service to the property or in terminating or restoring sanitary sewer service to the property in non-compliance.

Section 4.6. In addition to visual inspections on the outside and inside of the premises, the District may make other lawful tests and inspections of the sanitary sewer system as it deems necessary in order to locate such illegal connections and sources of extraneous flows as may exist. The District, at its option, may also invoke other legal powers vested in it or implied by the Illinois Compiled Statutes for the protection of the health and welfare of the public, and institute such legal action as it deems necessary to discover and order the disconnection of any illegal connections that may exist.

SAMPLE – DO NOT SIGN AT THIS TIME

AGREEMENT FOR COST REIMBURSEMENT PROGRAM
FOR THE INSTALLATION OF OVERHEAD SEWERS OR BACKFLOW PREVENTION DEVICES AND FOR PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL

This Agreement is made this ___ day of _____, _____, by and between the Downers Grove Sanitary District ("District") and _____ _____("Owners") of the premises located at:

Address: _____
_____

Legal Description: _____
_____
_____
_____

P.I.N.: _____

Whereas, the District has a cost reimbursement program for the installation of overhead sewers or backflow prevention devices ("Overhead Program"), and

Whereas, Owners desire to participate in the Overhead Program.

Whereas, the District has a program for the removal of infiltration and inflow sources on private property ("I/I Program"), and

Whereas, Owners acknowledge that participation in the Overhead Program requires compliance with the requirements of the I/I Program, and

Whereas, the District has conducted an evaluation of the property described above, including appropriate tests and inspections, in accordance with District ordinances, and

Whereas, the Owners and the District agree that there are connections on the subject property which discharge storm water, surface water or ground water into the sanitary sewer system of the District, and

Whereas, the Owners and the District desire to correct such illegal connections in accordance with the I/I Program.

Now, therefore, in consideration of the mutual covenants contained herein, the District and the Owners hereby agree to the following terms and conditions:

1) Owners have read and understand the program requirements for the Overhead Program attached to and made a part of this agreement as Exhibit A.

2) Owners have read and understand the program requirements for the I/I Program attached to and made a part of this agreement as Exhibit B.

3) The Owners agree to allow District employees, engineers, contractors and agents reasonable access to the subject property for the completion of all required work.

4) Upon compliance of Owners will all terms and conditions as stated in the program requirements, the District agrees to pay for all eligible work required under the I/I Program.

5) Upon compliance of Owners with all terms and conditions as stated in the program requirements, the District will provide a reimbursement to the Owners as allowed by the Overhead Program.

6) The Owners agree that if they fail to comply with all terms and conditions as stated in the program requirements, they shall be liable to the District for any and all costs incurred by the District for any work performed at the subject premises in the course of correcting illegal connections.

7) The Owners agree to retain ownership and operation, maintenance and replacement responsibility for all sump pumps, piping, connections and appurtenances which may be installed under this program and nothing contained herein shall transfer ownership or operation, maintenance or replacement responsibility for these facilities to the District.

8) Owners agree to release and waive any claim, suit or liability and to indemnify and hold harmless the Downers Grove Sanitary District, its trustees, officers, employees, engineers and agents, from and against all liability, damage, loss, claims, demands and actions of any nature whatsoever which arise out of or are connected with, or are claimed to arise out of or be connected with any previous sanitary sewer backups or the undersigned's participation in this program. This covenant shall include, but not be limited to, any consequence of the inspection of the premises, selection of the system installed or the contractor utilized, installation of the system, operation, maintenance or failure of the system once it is installed, or eligibility for, participation in or funding priority in the Overhead Program or the I/I Program.

9) Owners state that they are the owners of the premises listed above and that they have read and understand this Agreement.

DOWNERS GROVE SANITARY DISTRICT

_____

Lawrence C. Cox, General Manager

OWNER(S)

_____

_____

SAMPLE – DO <u>NOT</u> SIGN AT THIS TIME

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

I, the undersigned, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that «Name1» and «Name2», personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed and delivered the said instrument as their own free and voluntary act for the uses and purposes therein set forth.

GIVEN under my hand and official seal this _____ day of _____, 20__.

_____
Notary Public

SAMPLE – DO <u>NOT</u> SIGN AT THIS TIME

Prepared By: Michael C. Wiedel, 4915 Main Street, Downers Grove, Illinois 60515
Mail To: Downers Grove Sanitary District, 2710 Curtiss Street, Downers Grove, Illinois 60515

SAMPLE- DO NOT SIGN AT THIS TIME

BUILDING SANITARY SERVICE ACCESS AGREEMENT

In consideration of good and valuable consideration, receipt and sufficiency of which are hereby expressly acknowledged, _____ (hereinafter referred to as "Grantors"), legal owners of the below described property, hereby warrant, grant and convey to the DOWNERS GROVE SANITARY DISTRICT, a body politic and corporate of DuPage County, Illinois, (hereinafter referred to as "Sanitary District") its engineers, contractors, agents, successors and assigns, the right to inspect, test, measure flows or otherwise monitor each underground building sanitary service and the right of access thereto, in, upon, under, over, through and across the land over each building sanitary service from the property line to each building located on the following described property:

P.I.N.: _____

Common Address: _____

The access for said building sanitary service, herein granted, is subject to the following terms and covenants, which the Sanitary District expressly acknowledges, undertakes and agrees to fulfill, to-wit:

1. This access shall not unreasonably interfere with the use and enjoyment of the Grantors' property, by the Grantors, their successors and assigns.

2. In the event that a building sanitary service requires repair, reconstruction, rehabilitation or replacement, Grantors agree to cooperate with the Sanitary District to allow reasonable additional access for such work. The responsibility for the repair, reconstruction, rehabilitation or replacement shall be governed by ordinances of the Sanitary District in effect as of the date of this agreement and as subsequently amended from time to time.

3. If the surface of the subject property is disturbed by the Sanitary District, its engineers, contractors, agents, successors or assigns, at any time, and from time to time, by the inspection, testing, reconstruction, rehabilitation, repair or replacement in connection with said building sanitary service, the Sanitary District shall, at its sole cost and expense, repair and restore any disturbed property to substantially the same condition that existed immediately prior to such disturbances, including, without limitation, necessary repairs and replacement of paving and landscaping.

4. Grantors agree that the operation and maintenance of said building sanitary service shall be governed by ordinances of the Sanitary District in effect as of the date of this agreement and as subsequently amended from time to time.

The Sanitary District, as a condition of rights granted to it by this agreement, hereby agrees to protect, indemnify and hold the owners of the above described property harmless from and against any and all claims, demands, causes of action, losses, suits, liabilities, judgements and decrees relating to the use of this access agreement, and the costs and expenses (including attorney's fees) incident to the defense of and by such owners, in any manner caused by, resulting from, growing out of, connected with, or in any way attributable to its use of this access agreement.

"Grantors" do hereby warrant that they are the legal owners of the above described property. "Grantors" when used herein is intended to refer to the holder or holders from time to time of title to the Tract and to any portions thereof. All provisions of this Agreement, including the benefits of burdens, are hereby declared to run with the land and shall be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto, as well as, the

future owners of any part of the land subject to any easements created hereby. This agreement will be recorded with the DuPage County Recorder of Deeds to serve as notice to future owners of the subject property.

For the consideration expressed herein, the Sanitary District joins in the execution of this document for the purpose of accepting, consenting and agreeing to the terms and obligations contained in this agreement.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed as of this _____ day of _____, 20___.

DOWNERS GROVE SANITARY DISTRICT

_____

BY: _____

SAMPLE- DO NOT SIGN AT THIS TIME General Manager

_____

ATTEST: _____

Assistant Clerk

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

I, the undersigned, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that _____, personally known to me to be the same persons whose names are subscribed to the foregoing instrument appeared before me this day in person and acknowledged that they signed and delivered the said instrument as their own free and voluntary act for the uses and purposes therein set forth.

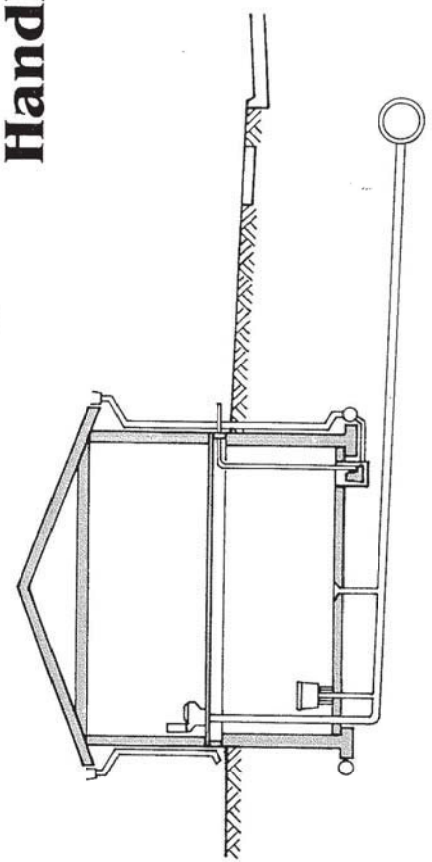
GIVEN under my hand and official seal this _____ day of _____, 20___.

_____

Notary Public

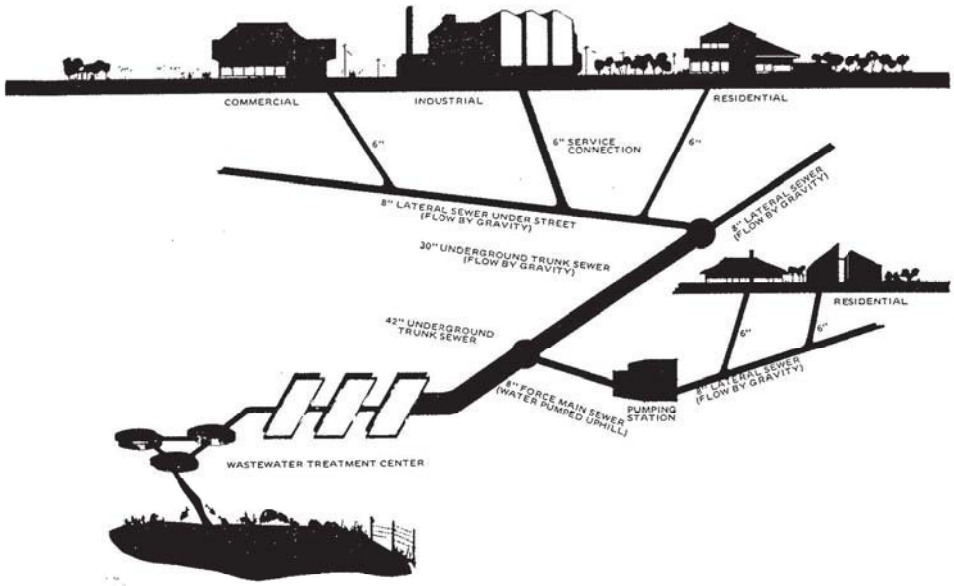
Prepared By: Michael C. Wiedel, 4915 Main Street, Downers Grove, Illinois 60515
Mail To: Downers Grove Sanitary District, 2710 Curtiss Street, Downers Grove, Illinois 60515

Downers Grove Sanitary District Sanitary Sewer Backup Handbook



2710 Curtiss Street
Downers Grove, Illinois 60515
969-0664

DOWNERS GROVE SANITARY DISTRICT
WASTEWATER COLLECTION SYSTEM



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I. Foreword

This handbook has been prepared by the Downers Grove Sanitary District to explain the causes of sewer backups that occur in the District during severe rainstorms and to describe steps that are available to homeowners to prevent backups and to protect the contents of their house.

Sanitary sewer backups have three main causes: a blockage located in the private sewer lateral (service line) from the house to the public sewer, a blockage in the public sewer main, or an overloading of the public sewer main during rainstorms.

While this handbook addresses backups which occur during rainstorms, the preventive measures and methods of correction will help to prevent backups caused by blockages of the service line and main sewer.

Even if you do not experience sewer backups, we hope that you will study the information since, quite unknowingly, you may be contributing to the problems. Your house may be contributing storm water runoff or ground water to the sanitary sewer system through plumbing connections that were made when the house was constructed. The storm or ground water may overload the sanitary sewer system and cause backups of sanitary sewage in some other resident's basement. You can help the situation by disconnecting these storm or ground water sources.

You should report a sanitary sewer backup as soon as it occurs and before you call a plumber. The District's telephone number, 969-0664, is manned at all times. District personnel will respond as discussed on page 16 of this handbook.

It is important to realize that backups may occur at any time due to blockages of your service line or the public sewer main, or during extreme rainstorm events. Therefore, you should consider improvements to your house to prevent future sewer backups. Since the improvements that will solve a problem in one situation may not be effective in other situations, the knowledge and skill of an engineer, a plumber and/or a sewer contractor may be needed to find the proper solution to the problem. Therefore, the only specific recommendation that can be made to all residents is: **secure competent help and advice in determining the proper course of action to be taken.**

The purposes of this handbook are to help you understand the real nature of your specific problem, to suggest methods that you may use to resolve the problem, and to explain when competent help is necessary to solve the problem.

II. The Nature of the Backup Problems

The Downers Grove Sanitary District owns and maintains a separate sanitary sewer system that is designed to collect only the sewage from the buildings in the District. If that were actually the case, many of the backup problems would not exist. Unfortunately, during rainstorms, storm water gets into the sanitary sewers which causes the basement backups.

The sanitary sewers are designed to collect the wastewater from the bathrooms, kitchens, etc., and transport it to the District's Wastewater Treatment Center for purification and discharge to the DuPage River. The system includes the District's sanitary sewer mains beneath the streets and the individual building services that extend from each house or building to the main sewer. The sanitary sewers are not designed to collect or transport the large amounts of storm water runoff that results from a rainstorm. Whenever significant amounts of storm water get into the sanitary sewers, the system's capacity is exceeded and surcharging (overloading) of the system and basement backups occur. Normally, the sanitary sewage enters the basement through the floor drain which is the lowest access point. If the surcharge elevation is much higher than the floor drain or if the drain is plugged, the sewage can enter the basement through a shower drain, toilet, or laundry tub.

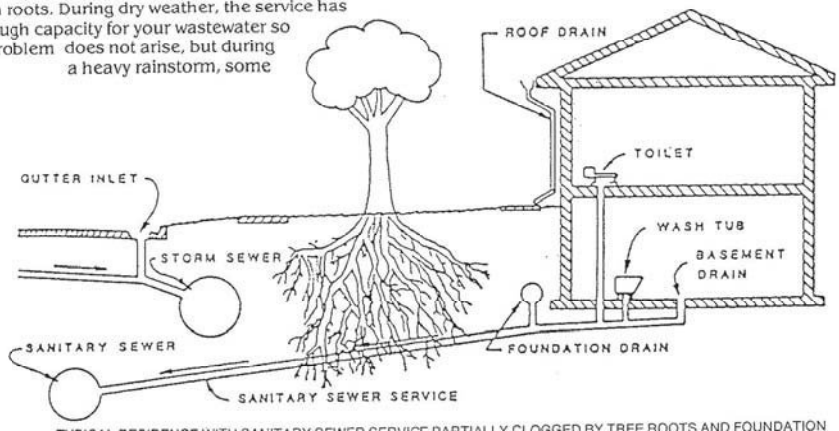
The storm water drainage system includes the storm water inlets in the streets, the storm sewer network, and Lacy, St. Joseph and Prentiss Creeks. The storm water drainage system is designed to collect and carry away the storm water runoff from the streets, driveways, roofs, and yards. The storm drainage systems are the responsibility of the local villages, the County, or special drainage districts.

III. Types of Backups and Their Problems

If you experience a backup during a rainstorm, it is probably caused by (A) a faulty private service pipe; or (B) an overloaded local sanitary sewer main in the street.

A. Faulty Private Service Pipe

The service line between your house and the District sanitary sewer may be broken or partially plugged with roots. During dry weather, the service has enough capacity for your wastewater so a problem does not arise, but during a heavy rainstorm, some storm water may be getting into your service and the extra water may exceed its restricted capacity which would cause the water to back up into your basement. If you experienced a backup but your neighbors with a similar basement and plumbing did not, this situation may be causing your problems.



TYPICAL RESIDENCE WITH SANITARY SEWER SERVICE PARTIALLY CLOGGED BY TREE ROOTS AND FOUNDATION DRAIN CONNECTED TO SANITARY SEWER SERVICE

FIGURE 1

Tree roots can become entangled in sewer lines, thus clogging pipes and causing sewer backup.

As the maintenance and repair of an individual building service is the responsibility of the building owner, the correction of a backup problem caused by roots or defective service pipes will be your responsibility. If your problem is caused by root blockage, it can be relatively easy and inexpensive to correct depending on which alternative action you choose. First, the sewer must be cleaned with an electric rodding machine using a root cutter that will thoroughly remove the roots that have grown into the pipe. Following that, the homeowner may elect to do the following:

1. **Periodic rodding** - Having the sewer rodded on a regular schedule to cut out all root growth will often be sufficient to keep them under control and reduce the likelihood of sewer backup. No rules can be given on how often this must be done because it depends on how active the roots are and how thorough a job the contractor is able to do. Some homeowners have found it necessary to have the sewer rodded as often as every six months, and others have found that once every few years is enough.

2. **Use of root remover products** - A number of root remover products are available commercially. Be sure to follow all of the manufacturer's instructions. Although these products may not completely eliminate the growth, they may increase the interval between needed rodding.

3. **Sewer pipe replacement** - The surest method of permanently correcting the problem is to have the sewer pipe dug up and replaced at the location where the roots are getting in. The new pipe used for replacement has a new type of joint that is tightly sealed to completely eliminate future entrance of roots. The sewer contractor or whoever performs the repair must be bonded with the Downers Grove Sanitary District and a Sewer Permit must be obtained from the District, at no charge. This is not, however, an inexpensive solution.

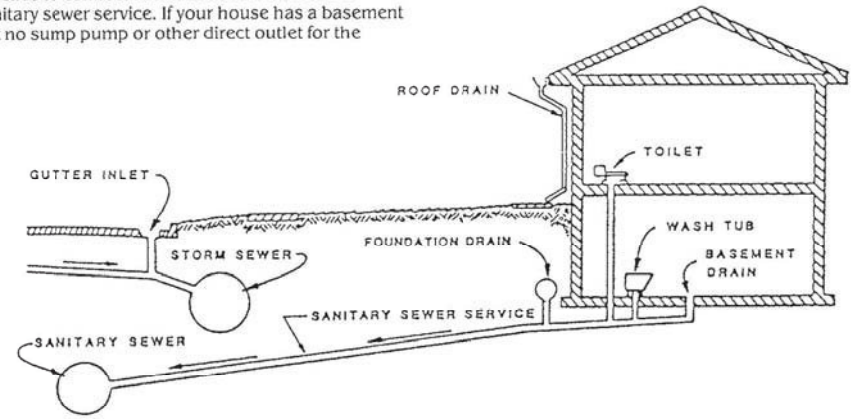
4. **Any ground water or storm water which enters the sanitary sewer, such as foundation drains, roof downspouts, or sump pumps must be removed from the sanitary sewer.** These types of connections are in violation of District ordinances and contribute significantly to the overloading of the sanitary sewer system.

Blockage of house sewers is also occasionally caused by broken or separated pipe. This is usually the result of soil settlement under the pipe or poor installation of the pipe. In these cases, there is little alternative than to dig up the pipe at the damaged location and make repairs.

A professional firm specializing in sewer repair can best advise on the type of blockage in a sewer, the location and the probability that it will recur. Before making any decision on how to proceed, we would strongly advise the homeowner to get more than one opinion (and cost estimate) on work needed to be done.

B. Overloaded Sanitary Sewer Main

The sanitary sewer main in the street may be overloaded during wet weather periods because the sewer system cannot handle the extra storm water that gets into the system. Much of the storm water gets into the system through plumbing connections that were made when the houses were first constructed, particularly the houses that were built prior to 1960. Prior to that time, it was common practice to connect the foundation drain to the sanitary sewer service. If your house has a basement but no sump pump or other direct outlet for the foundation drain, it is likely that your drains are directly connected to the sanitary sewers. Some houses have direct connections between the sanitary sewer service and the roof downspouts and/or an area drain. Each of these connections will contribute large amounts of storm water to the sanitary sewer system. **These connections are violations of District ordinances and must be disconnected.**



TYPICAL RESIDENCE WITH FOUNDATION DRAIN CONNECTED TO SANITARY SEWER SERVICE

FIGURE 2

If an overloaded sanitary sewer main is the cause of your sewer backup, your neighbors probably experienced similar problems. If so, you can either protect the contents of your basement and let the sewer continue to backup, or you can prevent the backups. If you want to simply protect the contents of your basement from damage, please refer to the tasks, warnings, advantages and disadvantages discussed in a subsequent section of this report. If you want to prevent the backups, several alternative procedures are available.

1. **Plugs or Standpipes:** Since the basement floor drain is the lowest opening to the sewer in your house, it is the first place of entry for the backup. The floor drain can be closed with a rubber plug or with a standpipe during heavy rainstorms. Some drains are specifically threaded for a screw-in plug or a standpipe. This is the simplest and least expensive way to stop backups through the drain, but it is effective only until the sewage level rises up to the level of the next opening, probably a shower, toilet, or sink. At that level, the sewage will overflow into your basement.

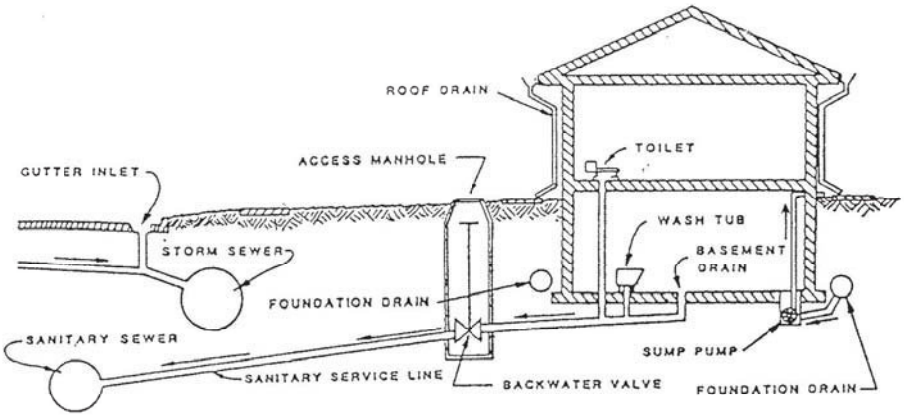
   If you use a plug or a standpipe, you must consider and protect against the possible uplift pressure on your basement floor. To be effective, a plug or standpipe confines the sewage to the pipes under the basement. If these pipes are watertight, the sewage won't leak out so no uplift presssure will develop. If the pipes are not watertight, the sewage will leak out of the pipes and saturate the ground beneath the floor. This sewage will then push up on your floor and if the pressure is large enough, your floor may buckle which would cause more damage than a basement backup. Since it is difficult to determine the condition of the pipes beneath your basement floor, plugs or tall standpipes should be used with caution. A "rule of thumb" which may be used as a guide is that a water level six inches higher than the basement floor level will not exert significant uplift pressure on the floor so, under normal conditions, a six-inch standpipe may reduce minor flooding without damage to the floor.

2. **Valve:** Since the sewer backup comes through the service line, an obvious solution is to install a valve in that line and to close that valve when flooding is imminent. The valve is normally installed in a manhole that is located outside the house where it is easier to install and maintain. Some valves are manual and others operate automatically such as a "check valve." The manual valves are not effective unless someone is available to close them. The automatic valves sometimes fail to close completely because sewage solids get jammed in the valve. In those cases, the valves may not prevent the backup.

When the valve is tightly closed, the sewage backup into the house is cut off, but the sewage flow from the house to the sewer is also cut off. Thus, the household plumbing cannot be used unless a pumped bypass is provided. Also, all storm water sources such as the foundation drain and roof downspout must be disconnected from the sanitary service, otherwise the storm water will back up into the basement through the floor drain. In addition, this connection is a violation of District ordinances.

Valves installed in sewer lines sometimes become "jammed" with debris and fail to close completely. In this case, the valve may slow down the backflow of sewage, but not stop it completely. For this reason, a valve installed on a sewer line should not be depended on for 100 percent protection, and an access manhole should always be provided for service and repair work.

A sanitary sewer permit, at no charge, is required from the District for this type of work.



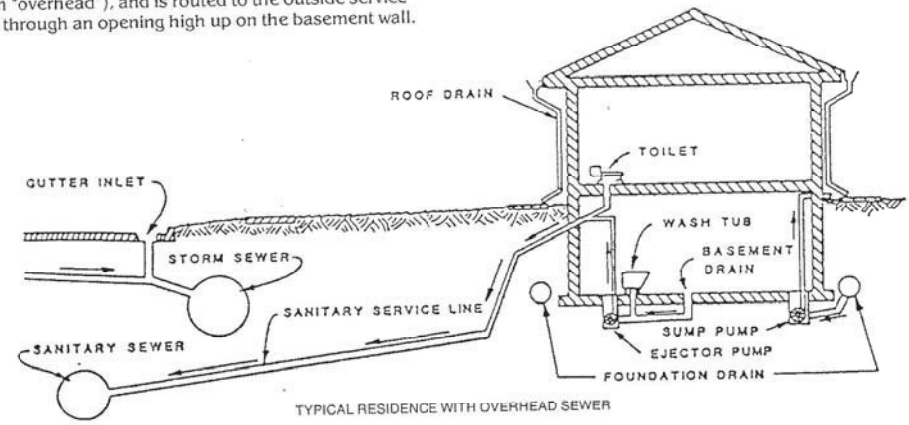
TYPICAL RESIDENCE WITH BACKWATER VALVE

FIGURE 3

3. **Overhead Sewer:** The term "overhead sewer" means that there are no direct openings to the sanitary sewer in the basement. All of the wastewater that is collected in the basement is discharged into a separate sump pit and pumped into the sanitary service line so the basement drainage is dependent on a pump and a continuous electric power supply. Generally, the plumbing from the fixtures on the main floor is installed just below the basement ceiling (hence, the term "overhead"), and is routed to the outside service line through an opening high up on the basement wall.

Converting your plumbing to an overhead sewer is one of the most expensive ways to prevent basement backups. Nevertheless, it is generally considered to be the best method available.

A sanitary sewer permit, at no charge, is required from the District for this type of work.



TYPICAL RESIDENCE WITH OVERHEAD SEWER

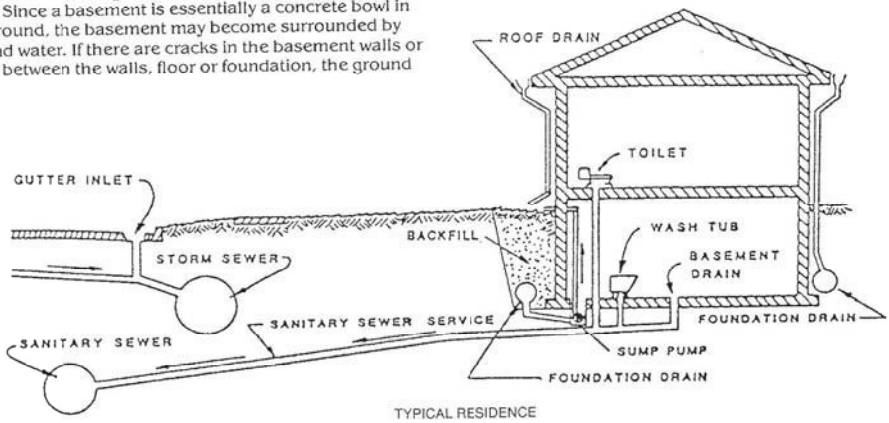
FIGURE 4

IV. Storm Water Flooding/Seepage

Apparent basement backups can be caused by ground water that enters the basement through cracks in the walls or through the basement sump or by storm water runoff flowing overland that enters the house through windows, doorways, or other openings.

Ground water is always present but the depth of the ground water is dependent on the soil type, ground surface elevation, surrounding topography and previous rainfall amounts. During rainstorms, some of the rainfall percolates into the ground which raises the ground water level. Since a basement is essentially a concrete bowl in the ground, the basement may become surrounded by ground water. If there are cracks in the basement walls or leaks between the walls, floor or foundation, the ground water will enter the basement. Minor leaks can be corrected by the careful application of special hydraulic cements, which must be applied in strict accordance with the manufacturer's recommendations to be effective.

At the base of most houses, there is a pipe that is laid all around the outside of the foundation. The pipe may be perforated or may have open joints so that the ground water can easily enter it. This foundation drain protects the house by draining the ground water away from the basement.



TYPICAL RESIDENCE

FIGURE 5

In many cases, the foundation drain is directly connected to the sump pump and all of the drainage must be pumped out of the basement.

Any flooding through the basement sump is either caused by: (1) a pump that does not work properly; or (2) by water entering the sump at a rate that exceeds the capacity of the pump. If you rely on a sump pump to keep water out of your basement, you may want to start a routine maintenance program to be sure that the pump will operate when needed. Such a program should follow the pump manufacturer's instructions. It could consist of:

1. Every month, pour some water into the pump to make sure that the pump operates and that it quickly empties the sump.
2. Every six months, check and clean the strainer on the suction side of the pump.

If the pump is working properly, the flooding could be caused by water entering the sump at a rate that exceeds the pump's capacity. The excess water floods the basement floor. The large amounts of water may be coming from the foundation drain, the roof downspouts, or both.

Grading - After construction of a house, the space around the basement is filled with backfill. In some cases, this backfill will settle, creating a low area adjacent to the basement walls. Any storm water runoff that gets into the low area will rapidly percolate down along the basement walls and will enter the foundation drain. This situation can be corrected by filling the low area with soil to create a slope away from the basement walls that will divert storm water runoff away from the basement and foundation drain.

Roof Downspouts - The roof downspouts can have a substantial impact on the flow from a foundation drain. In some cases, as shown on the right side of Figure 5, the roof downspouts are directly connected to the foundation drains. During an intense rainstorm, this type of downspout can discharge thousands of gallons of rainwater to the sump pit which can exceed the pump's capacity and cause basement flooding. To eliminate this problem, the downspout should be cut off above the ground surface and the drain pipe into the ground should be carefully sealed. An elbow and an extension should be installed on each downspout to direct the rainwater away from the basement. The extension should reach well beyond the old excavation.

If the existing downspout is not fitted with an extension as shown in the left side of Figure 5, the rainwater may collect near the basement wall and percolate directly to the foundation drain. To correct this situation, an extension should be installed on the elbow to direct the rainwater away from the basement walls.

If the house does not have roof gutters and downspouts, the rainwater falls directly off the roof and percolates along the basement wall. To correct this situation, gutters and downspouts with extensions will prove beneficial.

The importance of proper grading and proper discharge of the roof downspouts cannot be over-emphasized and the problems can be alleviated by simple measures performed by the homeowner.

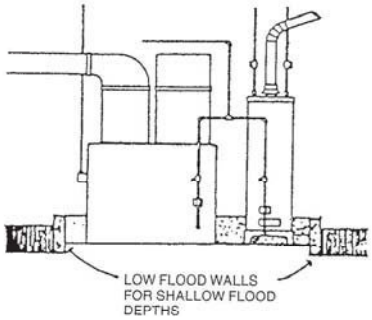
Overland Flow - Storm water flooding can be caused by water runoff that exceeds the capacity of the drainage system. The excess runoff flows overland and enters houses through windows, doors, or other openings. Generally, this type of flooding is more difficult and expensive to prevent than the flooding by ground water that was discussed above.

Basement flooding, caused by storm water runoff or seepage, is not a sanitary sewer backup. Flooding problems should be directed to your local village or other agency responsible for the storm drainage system in your area.

V. How To Minimize Damage From Backups

If it is impossible or prohibitively expensive to prevent a backup in your house, the damages can be minimized by measures aimed at protecting the house and its contents.

There are five main tasks to protect your house to reduce sewer backup damage. (These tasks may also help protect your home from flooding caused by storm water runoff or seepage.)



1. Relocate expensive items that are subject to water damage. Freezers, washers, dryers, furniture, power tools, large appliances and similar items should be permanently moved to higher floors.
2. Protect what cannot be moved. A floodwall or protection closet could be built around valuable, immovable equipment. Such protection walls must withstand all the pressure caused by the flood waters.

   Another alternative is to place the equipment on a pedestal above the flood height. Some equipment can be protected by a coating of grease or covering with plastic bags or plastic sheets.
3. Relocate or adjust your utilities. Either move all electric outlets above the flood level or install a control panel where the power can be shut off easily in time of flood. If your furnace, water heater, dryer, and other gas appliances are not all elevated, make sure there is an accessible gas shut-off valve.
4. Seal off the sewer and water systems to prevent health hazards caused by interflows with flood waters. A water heater moved to an attic can act as an emergency storage tank for a gravity-fed potable water supply. Heating and air conditioning ducts should have removable plugs along the bottom to permit water to drain out when the flood recedes.
5. Store things that are very quick to remove or items that won't be damaged; garden tools, metal furniture or cabinets, spare tires, boats, or floatable items (if water is shallow), plastic curtains, etc.

If you rebuild or improve the floodable area, use the following types of materials:

Concrete, concrete block or glazed brick; clay, concrete or ceramic tile; mastic, silicone or polyurethane formed-in-place flooring; terrazzo, rubber, vinyl or vinyl-asbestos floor covering with waterproof adhesives; stone, slate or cast stone (with waterproof mortar); glass or glass block; metal doors and window frames; foam or closed cell type insulation; polyester-epoxy or other waterproof type paint; indoor-outdoor carpeting (be able to remove it so the debris can be hosed out of it).

Do not use the following types of materials because they dissolve and decompose when wet or they absorb and retain too much water:

Wood, chipboard; gypsum products; cork; fabrics, carpeting, felt based floor coverings; linoleum; fiberboard, paperboard, strawboard; batt, blanket, and other types of insulation; wallpaper.

Certain items should not be stored in the floodable area because they would become especially hazardous or create health or pollution problems during a flood:

- Hazardous chemicals: chlorine, fluorine, acids, sulfur products, magnesium, many industrial chemicals.
- Hazardous household products: lye, pesticides, poisons, calcium hypochlorite (swimming pool chlorine), bleach, ammonia, lime detergents.
- Charcoal, coal, coal dust, coke, and hay are subject to spontaneous combustion when wet or moist.
- Gasoline, acetone, benzyne.
- Drugs, food (unless in tin cans).
- Storage tanks and buoyant materials can float and cause damage to walls, ceilings, and other contents.

Finally, here is a list of products that are particularly subject to flood damage. They should be removed, if possible, from any flood-prone areas as an extra precaution:

Appliances, clocks and other electric motors; art works, musical instruments; books, magazines, papers; clothing, curtains; televisions, radios, electronic equipment; upholstered furniture, mattresses; cabinets, pool tables, and similar wood furniture that would become useless with only a little warping.

Never enter a flooded basement unless absolutely necessary, and then only with extreme caution. The possibility of electrocution is always present. Always wear rubber boots. When cleaning the basement after water has receded, use caution around electrical outlets and appliances, and disconnect power from electrical equipment as quickly as possible.

VI. Cleaning Up Following A Backup

Shovel out any mud and debris while it is still moist and hose down the walls to remove silt. To get rid of any odor that may accompany a backup, scrub all interior wetted surfaces. Use hot sudsy water followed by double strength sanitizing solution, or use a household disinfectant, following manufacturer's directions. Repeat scrubbing and rinsing if necessary. You may also try sprinkling liberally with baking soda. Odors in the basement may be harder to treat. If the above approaches don't work, sprinkle bleaching powder (chlorine or lime) over the floor. Let it dry then sweep it up. Remember, bleaching powder is caustic and poisonous. Follow all the precautions on the label.

Wooden floors dry very slowly. Assuming your furnace is operational, keep the house at 60-70 degrees F. to hasten drying but don't overheat the house as this could cause cracking or splitting. All loose plaster should be removed because plaster board and drywall can be ruined if immersed for a long time. Removal will also speed drying of the walls and will enable you to inspect the insulation in the exterior walls. Any waterlogged insulation must be replaced.

Mildew may appear if a warm spell follows a flood. Scrub mildewed floors or woodwork with a mild alkali solution such as washing soda or tri-sodium phosphate (four to six tablespoons to a gallon of water). Badly stained walls will need new paint.

All electric motors that have gotten wet should be disconnected and thoroughly cleaned to get rid of dirt and grit. After cleaning, the motors should be re-oiled and allowed to dry for two weeks. You can shorten the drying time by using a fan or hair dryer.

Washers should be sanitized by pouring a disinfectant such as chlorine, pine oil, or phenolic into the empty washing machine, and then complete a 15-minute cycle at the hot setting. The dryer can be cleaned by wiping the drum with a cloth dipped in a disinfectant solution, rinse with cloth dipped in clear water. Leave washer and dryer doors open, preferably overnight, until all parts are dry.

Clothing, sheets, etc., should be hosed or rinsed with cool water to get as much mud out as possible. Then wash with as much detergent as possible. Bleach or other disinfectant should be used to kill bacteria. After drying, rugs and carpets can be cleaned with a vacuum cleaner and then shampooed.

Gasoline engines need to be thoroughly inspected and cleaned. All electrical parts must be dry. Grit or silt must be removed from the oil, transmission or gas lines.

VII. Summary

Problems which cause the sanitary sewers to occasionally back up are many and they are often interrelated. Many residents of the District may be worried and inconvenienced by the occurrence of a sewer backup in their basement or crawl space. It is our hope that if you have such a problem, you have found some suggestions in this report which may be of help. If you have a question regarding the connections in your home, call our office at 969-0664 during our regular business hours, 8:00 A.M. to 4:30 P.M., Monday through Friday.

In conclusion, please remember that the District's telephone number, 969-0664, is manned 24 hours a day, seven days a week, in the event you must contact the District to report a sanitary sewer backup or other emergency. **Call this number as soon as the backup occurs and before you call a plumber.** District personnel will respond as promptly as possible. If the backup is caused by a blockage located in the public sewer main, the problem will be corrected. If, however, the backup is caused by an overloading of the public sewer main during a rainstorm, the problem cannot be relieved and your backup will not recede until the rainstorm stops and overloading of the sewer main subsides, which may take several hours. If the backup is caused by a blockage in your private service lines, you must take appropriate measures to eliminate the problem.

ORDINANCE NO. 1793-0602

ORDINANCE (1) AMENDING POLICIES, STANDARDS AND REQUIREMENTS FOR DISTRICT EASEMENTS AND REGULATING EASEMENT ENCROACHMENTS, AND (2) RESCINDING ORDINANCE NO. 1726-1299

The Board of Directors of Stege Sanitary District finds and determines:

A. On December 16, 1999, the Board adopted Ordinance No. 1726-1299, an "Ordinance Establishing Policies, Standards and Requirements for District Easements and Regulating Easement Encroachments."

B. Amendments to Ordinance No. 1726-1299 are necessary and desirable and will be best accomplished by rescinding Ordinance No. 1726-1299 in its entirety and adopting this Ordinance in its place.

In consideration of the foregoing findings and determinations,

IT IS ORDAINED by the Board of Directors of Stege Sanitary District as follows:

1. Definitions. For the purposes of this Ordinance, the following terms have the meanings specified below:

1.1 "Easement" means a property right, however created, by which the owner of the right is entitled to make specified uses of the real property of another person; "easement" include, "reserve," "sewer reserve," or "utility reserve".

1.2 "Wastewater facilities" means pipelines, pump stations, or any other structures, equipment and machinery, including appurtenances to them, which are used to collect, convey, treat, dispose of and reuse wastewater.

1.3 "Encroachment" means an activity or condition which results in interference with the rights of the owner of an easement. As used in this Ordinance with respect to District easements, there are three classes of encroachments:

Class One. Encroachments which interfere only slightly with District easements. Examples may include loose paving stones and similar landscaping features, flowerbeds, small shrubs, lawn and ground covers which do not impede normal use and operation of District wastewater facilities and may readily be removed and restored at a modest cost if access to the facilities is required.

Class Two. Encroachments which will cause significant interference with District easements but which, due to being readily removable or by virtue of District mandated safeguards and/or mitigation measures, the interference can be ameliorated to an acceptable level. Examples may include fences, gates, driveways, paving, portable or readily removable

structures, larger vegetation whose roots do not have a propensity to invade wastewater facilities, and cuts and fills.

Class Three. Encroachments which will cause significant interference with District easements. Examples may include permanent structures such as buildings, swimming pools, permanent decks, retaining walls and reinforced concrete or masonry; temporary structures which are not readily removable from the easement; also trees, heavy brush, and vegetation that prevents District access to its facilities in the easement; also any activities and conditions that are unlawful or prohibited by this Ordinance or by other applicable laws.

1.4 "Significant interference" means, with respect to encroachments on District easements, an activity or condition which has the potential to impede access to or damage District wastewater facilities or which will result in excess of one person-hour of effort by the District to use the easement for its intended purposes.

2. District Policies Concerning Easements. The following are District policies concerning easements:

2.1 Wherever feasible, District-owned wastewater facilities shall be located on lands owned by the District, public lands to which the District has largely unrestricted access or in public streets, roads, highways or other public rights of way in which, by law, the District is entitled to construct, install, operate and maintain its facilities.

2.2 District-owned wastewater facilities shall not be located and permanently installed on or in private property, unless the District has acquired an easement or easements for the facilities conforming to this Ordinance. Temporary installations may be made pursuant to a license or other similar authorization approved by the District.

2.3 The location of District wastewater facilities, as described in Section 2.1, is strongly preferred over the type of location described in Section 2.2.

2.4 In furtherance of the policy stated in Section 2.3, District wastewater facilities should not be installed in easements over private property unless:

2.4.1 Installation in a Section 2.1 location is not possible, would be impracticable or would be unduly burdensome; and

2.4.2 The District's easement rights shall be sufficient to enable the District to operate and maintain its facilities without excessive cost or other undue difficulty.

2.5 Subject to its right to abandon or relinquish ownership of any wastewater facilities which are no longer in use and which are not required for future District

needs, the District claims that as of the effective date of this Ordinance, it has acquired and owns easement rights for all District wastewater facilities which are located in or on private property, whether or not the District's easement rights are evidenced by a recorded written instrument or other writing providing notice of the District's claimed easement rights.

3. Creation of District Easements

3.1 District easements may be created in any manner allowed by law so long as the easement has been approved and accepted by the District.

3.2 Notwithstanding Section 3.1 above, easements to be conveyed to the District should ordinarily be created by express grant or reservation in a written instrument eligible for recordation in official records of the County of Contra Costa. The form and content of the instrument shall be acceptable to the District but shall not be effective until the instrument has been duly delivered to, approved and accepted by the District.

4. Minimum Standards for Easements

4.1 Unless expressly waived by the District for good cause, an easement conveyed to the District shall be subject to the following minimum standards:

4.1.1 For the purpose of exercising its principal easement rights, the District shall also be afforded the right of ingress and egress to, from, along, on, in, above and below the surface of the land encompassed by the easement.

4.1.2 The easement shall be subject to the provisions of this Ordinance and to other rules and regulations promulgated by the District.

4.1.3. In the case of easements for pipelines, the easement shall have a horizontal width of not less than ten (10) feet

4.2 Easements shall be for the exclusive benefits of the District or they may be non-exclusive. If the easement is nonexclusive, other users of the territory encompassed by the easement shall be prohibited from interfering with the District's easement rights.

5. Unlawful Acts. It is unlawful for any person to:

5.1 Cause or permit an unauthorized encroachment on a District easement;

5.2 After notice, fail to abate or otherwise remove or discontinue any action or condition which results in an unauthorized encroachment;

5.3 Abandon any items of property, including motor vehicles, on or within a District easement;

5.4 Deposit any debris, garbage, trash, toxic substance, liquid or solid waste or other form of refuse on or within a District easement;

5.5 Cause, permit or maintain any activity or condition off or outside the territory of a District easement which causes directly or indirectly a significant interference with the District's easement rights; or

5.6 Cause or permit any activity or condition on or within a District easement which constitutes a public or private nuisance.

6. Authorized and Unauthorized Encroachments

6.1 A property owner may make use of the land over which the District has an easement if those uses do not result in significant interference with the easement.

6.2 Except as provided in Section 7, Class Two and Class Three Encroachments are not authorized and shall not be maintained or permitted on District easements.

6.3 The owner of the property over which the District has an easement and any other person who has caused or permitted an unauthorized encroachment to exist is obligated to promptly remove and eliminate the encroachment.

7. Encroachment Permits. The owner of a property over which the District has an easement who wishes to maintain a Class Two Encroachment or to obtain Grandfather Relief for a Class Three Encroachment, shall apply for and obtain a District Encroachment Permit. No permit is required for a Class One Encroachment.

7.1 The District shall establish and the applicant shall comply with such procedures as are required to process and act on the application, including payment of applicable fees, completion of approved application forms, and submission of specified information needed to evaluate the application.

7.2 An Encroachment Permit shall be issued if:

7.2.1 The applicant has fully complied with all District requirements and procedures pertaining to issuance of the Permit;

7.2.2 The applicant has accepted and agreed to all conditions upon which the Permit is proposed to be issued (see Section 8);

7.2.3 With respect to Class Two Encroachments, the District finds that as conditioned, the Permit shall ensure that the Class Two Encroachments authorized by the permit will not result in significant interference with the District's easement; and

7.2.4 With respect to Grandfathered Class Three Encroachments, the District finds that as conditioned, the Permit shall to the greatest extent

reasonably possible preserve the District's easement rights while at the same time, in the interests of fairness and substantial justice, make appropriate allowances for justifiable concerns of the property owner. (See Sections 8 and 10.) Under no circumstances shall a Class Three Encroachment be eligible for Grandfathering if:

7.2.4.1 Grandfathering could result in a violation of any statute, regulation, order or other provision of law promulgated or enacted by a federal, state or local government entity having jurisdiction over the matter in question;

7.2.4.2 Grandfathering would be materially detrimental to the public health, safety and welfare; or

7.2.4.3 Grandfathering would result in undue hardship to other persons.

8. Encroachment Permit Conditions. The District shall not issue an Encroachment Permit unless conditioned as follows:

8.1 The applicant shall be obliged to fully perform and satisfy all conditions of the Permit;

8.2 When required by the District, the applicant shall cooperate with the District and shall execute a written instrument in recordable form which, when recorded by the District, will place on public record provisions of the Permit which are intended to be known and binding upon any person who succeeds to ownership of an interest in the real property which is subject to the District's easement;

8.3 The permit shall be subject to all of the provisions of this Ordinance;

8.4 With respect to Class Two Encroachments, the Permit shall be conditioned so as to mitigate the effects of the encroachment and safeguard the District's easement rights such that the effect of the mitigation measures and safeguards shall prevent the encroachment from causing significant interference with the District's easement; and

8.5 With respect to Grandfathered Class Three Encroachments, the Permit shall include conditions, which, to the extent reasonably possible under the circumstances, will:

8.5.1 Eliminate the encroachment in due course; and

8.5.2 Until eliminated, alleviate the impacts of the encroachment on the District's easement by requiring mitigation measures and/or safeguards and/or by shifting to the property owner and/or other responsible parties

any financial detriment which may be suffered by the District due to the existence of the activity or conditions.

9. Other Regulations. By resolution of the District's Board of Directors adopted from time to time, as the Board deems necessary and appropriate, the District may promulgate and amend rules, regulations and procedures to implement the provisions of this Ordinance, including the following:

9.1 Establish rules, regulations, and procedures concerning applications for and issuance of Encroachment Permits;

9.2 Set fees and charges for District services related to easements;

9.3 List and categorize activities and conditions which constitute encroachments; and

9.4 Establish standard Encroachment Permit conditions applicable to specific activities and conditions including mitigation measures, safeguards and similar provisions.

10. Grandfathering. A ClassThree Encroachment which was in existence prior to the effective date of this Ordinance may be maintained and shall not be subject to immediate mandatory removal if the encroachment is Grandfathered pursuant to this Section. An encroachment shall be Grandfathered if the applicant has applied for and obtained an Encroachment Permit pursuant to Section 7.2.4 of this Ordinance.

11. Removal and Restoration of Improvements Which are Disturbed by District Activities. Whenever District activities in District easements result in the need for improvements or other activities or conditions of the real property subject to the easement to be removed or otherwise disturbed, the following provisions shall apply:

11.1 Conditions and Activities Not Constituting Unauthorized Encroachments. The District may, at the expense of the District, temporarily remove or discontinue the activity or condition, and upon completion of the District's activities, the District shall, at the District's expense, restore the activity or condition in kind.

11.2 Encroachments Authorized by Permit. If the encroachment is authorized pursuant to an Encroachment Permit and the Encroachment Permit does not provide otherwise, the District shall, at the District's expense, restore the activity or condition in kind.

11.3 Unauthorized Encroachments. Unauthorized encroachments shall be permanently removed by the property owner and/or other responsible person and shall not be restored. Removal shall be performed promptly by and at the expense of the property owner/responsible parties. If the encroachment has not been removed within a reasonable time after notice has been given by the District, or if the urgency of the District's easement activities requires that the activities be

commenced without prior notice, the District may remove the encroachment itself, but the removal costs shall be charged back to the property owner/responsible party.

12. District Remedies. Remedies granted to the District in this Ordinance are in addition to any other rights and remedies which are available under this Ordinance or which are otherwise afforded by law, and the District is entitled to exercise any and all such rights and remedies, either serially or cumulatively, as determined by the District.

13. Request for Relief by Affected Persons. Any person who contends that his/her/its rights have been adversely affected by any action of or failure to act by the District in connection with the provisions of this Ordinance, may seek relief from the District under such rules and procedures as the District shall establish.

14. Superseding Effect. This Ordinance supersedes Ordinance No. 1726-1299 and all other previous and currently existing regulations which are in conflict with its provisions, and all such regulations are rescinded and repealed as of the date this Ordinance becomes effective.

15. CEQA. In accordance with the California Environmental Quality Act ("CEQA"), Public Resources Code sec. 21000 et seq. and the regulations promulgated pursuant to CEQA ("the State Guidelines"), the Board of Directors finds that this Ordinance is not a "project" within the meaning of the Act or the State Guidelines.

16. Effective Date. Upon adoption, this Ordinance shall be entered in the minutes of the Board and shall be published in the El Cerrito Journal promptly following its passage and adoption, and this Ordinance shall take effect and be in force and effect immediately upon the expiration of the week of publication.

* * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF CONTRA COSTA)

I HEREBY CERTIFY that the foregoing Ordinance was duly and regularly adopted by the Board of Directors of the Stege Sanitary District, at a regular meeting thereof, held on the 20th day of June 2002 by the following vote:

AYES:	BOARD MEMBERS:	James, Merrill, Miller, O'Keefe, Bruce
NOES:	BOARD MEMBERS:	None
ABSENT:	BOARD MEMBERS:	None
ABSTAIN:	BOARD MEMBERS:	None

DOUGLAS BRUCE, President
Stege Sanitary District
Contra Costa County, California

ATTEST:

DOUGLAS HUMPHREY, Secretary
Stege Sanitary District

Board of Trustees
Donald E. Eckmann
President
Wallace D. Van Buren
Vice President
David J. Morrill
Clerk

Downers Grove
Sanitary District

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Providing a Better Environment for South Central DuPage County

Staff
Lawrence C. Cox
General Manager
Ralph E. Smith, Jr.
Operations Director
Sheila K. Henschel
Administrative Services Director
Legal Counsel
Michael C. Wiedel

DOWNERS GROVE SANITARY DISTRICT

PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL PROGRAM

In order to address continuing sewer backup and manhole overflow problems, the District has implemented a comprehensive infiltration and inflow removal and sewer system rehabilitation policy. One important part of this policy is the Private Property Infiltration and Inflow Removal Program. The majority of infiltration and inflow (I/I) comes from private property. District ordinances prohibit all sources of I/I from private property. If I/I sources are located on private property, the District will provide assistance and work with the property owner to determine the most feasible methods of removing the sources of I/I, obtain proposals from contractors for completion of the work and inspect the work. The District will provide financial assistance by paying for the costs of identifying and removing all eligible I/I sources. The following materials regarding this program are attached.

- Program Summary
- Program Requirements
- Application for Participation
- Agreement for Private Property Infiltration and Inflow Removal
- Building Sanitary Service Access Agreement

After review of the enclosed material, please contact our office if you have any questions or need any additional information. The program information is also available on the District website.

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Printed on Recycled Paper

DOWNERS GROVE SANITARY DISTRICT
PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL PROGRAM

In order to address continuing sewer backup and manhole overflow problems, the District adopted a comprehensive infiltration and inflow removal and sewer system rehabilitation policy. One important part of this policy, the Private Property Infiltration and Inflow Removal Program, was recently adopted. To understand the significance of this program and the need for citizen participation and cooperation, the following information is provided.

Sanitary Sewer System

The sanitary sewer system consists of both a public portion and a private portion. The public portion includes sanitary sewer lines and manholes, located in the public right-of-way, which collect and transport wastewater to the District wastewater treatment center. The private portion includes homes and businesses and building sanitary services which receive the wastewater from a home or business and connect to the public sanitary sewer. The sanitary sewer system is designed to receive only wastewater, not storm water or ground water.

Infiltration and Inflow

Infiltration and inflow, commonly referred to as I/I, is storm water or ground water that enters the sanitary sewer system from any source on either the public portion, a building sanitary service, or within a building.

Problems Caused by Infiltration and Inflow

High levels of I/I overload the sanitary sewer system in a significant way. Normal flows to the Wastewater Treatment Center during dry weather average 8 million gallons per day. During significant rainfall or snow melt, I/I results in these flows reaching peak rates in excess of 80 million gallons per day, ten times the dry weather flow. This excess flow is responsible for sanitary sewer backups into homes and businesses, manhole overflows, and increased costs required for treatment of flows which would otherwise be runoff into the ground or storm sewers.

Reducing Infiltration and Inflow

To make significant reductions in I/I, the problem must be addressed by removing sources from both the public portion and the private portion of the system. To reduce I/I from sources in the public sanitary sewers, the District has an ongoing aggressive program for maintenance, rehabilitation and repair. This work includes televising and cleaning of the sanitary sewers, flow monitoring, smoke testing, flood testing, manhole repairs and rehabilitation, sewer lining and sewer replacement projects.

The majority of infiltration and inflow comes from private property. District ordinances prohibit all sources of I/I from private property. To address these sources of I/I, for many years, the District has conducted building inspections to identify and require correction of any downspout

or sump pump connection which contributed I/I. Other major sources of I/I from private property include direct footing drain connections, indirect footing drain connections, roof drains, driveway drains, area drains, patio or yard drains, leaking sanitary or ejector sump pits, leaks in subsurface sanitary waste piping or the building sanitary service, etc. The District must now identify and correct these I/I sources. These sources were not addressed in previous inspections of buildings because of the cost of identification and correction. The Private Property Infiltration and Inflow Removal Program has been implemented to address these I/I sources.

Selection of Areas for the Private Property Infiltration and Inflow Removal Program

In order to determine the extent of I/I, intensive flow monitoring is performed on the sanitary sewer system. This flow monitoring allows the volume of infiltration and inflow to be determined by area. Those areas with the largest volumes of I/I are selected for rehabilitation which will include the Private Property Infiltration and Inflow Removal Program. After rehabilitation, flow monitoring is used to evaluate the effectiveness of the rehabilitation efforts in reducing I/I. Your area is the first to be selected for this program.

Identification of sources of I/I

Generally, two inspections are needed to identify any sources of storm water or ground water discharges from private property. The first inspection is a preliminary investigation of the plumbing system in the basement or crawlspace and the area around the outside of the building. This preliminary inspection generally takes approximately 60 minutes. The second inspection involves inserting a small television camera into the building sanitary service pipe from inside the building and injecting water into the ground in the area over this pipe on the outside of the building to identify and locate any leaks. This second inspection can take from one to two hours, depending upon individual conditions. There is no charge for either of these inspections.

Removal of I/I sources

The District will provide assistance and work with the homeowner to determine the most feasible methods of removing the sources of I/I, obtain proposals from contractors for completion of the work and inspect the work. The District will provide financial assistance by paying for the costs of identifying and removing all eligible I/I sources. Eligible I/I sources include installation of storm water sump pits, pumps and piping; repair, rehabilitation or replacement of subsurface sanitary waste piping or the building sanitary service; and reasonable restoration. The installation of a footing tile drainage system or the disconnection of downspout or sump pump connections is not eligible.

If I/I sources are located, the District will provide the building owner with the detailed Program Requirements. The detailed Program Requirements can also be obtained at any time by calling the District office.

The financial assistance is being provided by the District to recognize that the removal of I/I from the sanitary sewer system benefits all users of the system and, therefore, the costs of this removal should be paid by all users as a system cost. The program also provides a mechanism to insure that the work is performed cost effectively and in a manner which protects the integrity of the sanitary sewer system.

Compliance with the Program

Your home or building may have been inspected by the District in the past. These prior inspections identified only those sources of I/I which could be readily identified by a visual inspection and did not involve the testing and television inspection elements of the new program. We are appreciative of this past cooperation.

The District is hopeful that all property owners will cooperate in this important and necessary new program. The District will make every effort to work with the property owner to accomplish the goal of significant I/I removal. It is important to note that District ordinances require compliance with the program. Storm water or ground water connections to the sanitary sewer, if found, must be eliminated. A schedule for compliance will be implemented for any property owner who fails to schedule inspections or follow through with corrections.

Your cooperation and assistance in this program are crucial to the success of this extraordinary effort to eliminate sanitary sewer backups into homes and businesses and manhole overflows.

If you have any questions or would like any additional information, please feel free to contact the District office at 969-0664. The office is open Monday through Friday, 8:00 a.m. to 4:30 p.m.

APPROVED MAY 2001
REVISED OCTOBER 2001

DOWNERS GROVE SANITARY DISTRICT
PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL PROGRAM

PROGRAM REQUIREMENTS

BACKGROUND

District ordinances prohibit the discharge of any stormwater, surface water, ground water, roof runoff water, sub-surface drainage, runoff water from ground or paved areas, cistern overflow or any flows other than wastewater into the District sanitary sewer system. These flows, referred to as infiltration and inflow or I/I, overload the sanitary system, resulting in the backup of raw sewage into basements and the overflow of raw sewage from manholes. Infiltration and inflow (I/I) can be contributed from private property through direct footing drain connections, indirect footing drain connections, sump pumps, downspouts or roof drains, driveway drains, area drains, patio or yard drains, leaking sanitary or ejector sump pits, leaks in subsurface sanitary waste piping or the building sanitary service, etc. In 1973, the District began inspecting buildings to identify downspout and sump pump connections which contributed I/I to the sanitary sewer system. Property owners were requested to correct any downspout or sump pump connection which contributed I/I and these corrections have been completed at the property owner's expense. A copy is attached of those sections of District ordinances which prohibit the discharge of I/I into the sanitary sewer system, provide for District inspections to identify such sources and require the correction of any such illegal connections.

Unfortunately, the District sanitary sewer system continues to receive high levels of I/I. Normal flows to the District Wastewater Treatment Center during dry weather average 8 million gallons per day. During significant rainfall or snow melting events, these flows reach peak flow rates in excess of 80 million gallons per day. The majority of these I/I flows are coming from private property. As a result, in order to reduce I/I, the District must now identify and correct the remaining I/I sources, such as direct footing drain connections, indirect footing drain connections, driveway drains, area, patio or yard drains, and leaks in subsurface sanitary waste piping or the building sanitary service. These sources have not previously been addressed because of the cost of identification and correction. The District developed this Private Property Infiltration and Inflow Removal Program to address these I/I sources.

PROGRAM REQUIREMENTS

The District will provide assistance to property owners to identify and remove infiltration and inflow sources located on their property as detailed in this program. This program is being implemented to recognize that the removal of infiltration and inflow from the District sanitary sewer system benefits all users of the system and, therefore, the costs of this removal should be borne by all users as a system cost. This program will also provide a mechanism to insure that

this work is performed properly and in a manner which protects the integrity of the District sanitary sewer system.

The District has determined that certain requirements for the Private Property Infiltration and Inflow Removal Program are necessary to protect the integrity of such a program and the financial well being of the District.

A private property infiltration and inflow removal assistance program is hereby implemented under the following conditions and requirements:

1) The following I/I sources are eligible for removal under this program: direct footing drain connections, indirect footing drain connections, driveway drains, area drains, patio or yard drains, leaking plumbing waste lines, or leaks in subsurface sanitary waste piping or the building sanitary service. The following I/I sources are <u>not</u> eligible for removal under this program and must be removed at the owner's sole expense: sump pumps, downspouts, or roof drains.

2) This program applies to all buildings connected to the Downers Grove Sanitary District sanitary sewer system which meet one of the following criteria:

   a) Building is located within an area selected by the District for infiltration and inflow removal.

   b) Building owner has applied for the District Cost Reimbursement Program for the Installation of Overhead Sewers or Backflow Prevention Devices.

3) This program shall be effective June 4, 2001.

4) The program will be evaluated annually and the District may change or eliminate the program.

5) This program is limited to funds budgeted for the program. Funding levels may be changed or eliminated based on the District's annual review of the program.

6) Prioritization of applications shall be at the sole discretion of the District. For purposes of prioritizing applications, the District may consider the severity of the I/I flows, costs for corrective measures, time constraints, and such other considerations as the District deems necessary.

7) An owner desiring to participate in this program must sign an Agreement for Private Property Infiltration and Inflow Removal (hereinafter referred to as the "Program Agreement") and a Building Sanitary Service Access Agreement (hereinafter referred to as the "Access Agreement"). Said Program Agreement shall include, among other items, a clause whereby the Owner releases and waives any claim of liability against the District from any consequence of their participation in

the program including, the District's determination of corrective actions, selection of the contractor to be utilized, implementation and completion of the corrective action, or the owner's eligibility, participation or funding priority in this program.

8) The District will pay for the costs of identifying and removing all eligible I/I sources, including testing; televising; installation of storm water sump pits, pumps and piping; disconnection of existing drains from the sanitary sewer and connection to a storm water sump or piping; repair, rehabilitation or replacement of subsurface sanitary waste piping or the building sanitary service, and reasonable restoration. The installation of a footing tile drainage system is not eligible for assistance under this program.

9) The property owner retains ownership and operation, maintenance and replacement responsibility for all sump pumps, piping, connections and appurtenances which may be installed under this program. Nothing contained in this program shall transfer ownership or operation, maintenance or replacement responsibility for these facilities to the District.

10) The property owner retains ownership and maintenance responsibilities for the building sanitary service serving the subject property and nothing contained in this program shall transfer ownership or maintenance responsibilities of the building sanitary service to the District.

11) The District's assistance is limited to the actual costs incurred for the eligible work contained in this program.

12) This program includes the following steps:

a) Letter is sent to property owner explaining the program and requesting that the owner schedule the preliminary inspection of the building.

b) District personnel conduct preliminary inspection of building, take measurements, interview owner, complete inspection form, and take photos or videos, as appropriate. District schedules date for second inspection with the owner.

c) District conducts second inspection including televising and locating all subsurface sanitary waste piping and the building sanitary service, dye testing all outside drains and any suspect downspouts, and performing flood and/or dye test to ascertain leaks and footing tile.

d) Based upon review of all data, the I/I quantity from each source is estimated and a cost-effective rehabilitation method is developed by the District.

e) The District provides the owner with written findings of the inspections, the recommended rehabilitation method(s) and the eligibility of these methods under this program. These items are reviewed and discussed with the owner during a follow-up site visit.

f) The District schedules site visits with the owner and appropriate contractors to review the proposed work and to assist the contractors in the preparation of proposals for the completion of the recommended repairs.

g) The District receives proposals from contractors, evaluates each proposal and selects the lowest, responsible proposals for the work.

h) The District prepares and sends to the property owner for signature the Program Agreement and the Access Agreement.

i) The property owner signs and returns to the District the Program Agreement and the Access Agreement. The District schedules the work with the owner and the contractors.

j) The contractors complete the work. The District inspects the work and performs any appropriate testing. The Village also inspects the work.

k) Upon acceptance, the District pays the contractors for the work.

13) The General Manager may, in his discretion, provide a waiver of those program requirements listed above which he deems appropriate based on his evaluation of the individual circumstances.

14) The District shall have the sole authority to determine eligibility for participation, prioritization of requests and compliance with all requirements for the program and District ordinances.

EXCERPT FROM DISTRICT ORDINANCES

ARTICLE II - USE OF PUBLIC SEWERS

Section 4. No person shall discharge or cause to be discharged into the sanitary sewer system any storm water, surface water, ground water, roof runoff water, sub-surface drainage, runoff water from ground or paved areas, cistern overflow or water from air-conditioning systems, industrial cooling operations, or any flows other than wastewater.

Section 4.1. The proper maintenance and operation of a building sanitary service to and including the point of connection (such as a wye, tee or break-in connection) to the public sanitary sewer shall be the responsibility of the owner of the premises served by said building sanitary service. Maintenance means keeping the building sanitary service in satisfactory working condition and a good state of repair (including but not limited to preventing any obstruction or extraneous material or flows from entering said facilities, protecting said facilities from any damage and keeping same free from defects or malfunctions), and making necessary provisions and taking necessary precautions to assure that said sanitary sewer facilities are at all times capable of satisfactorily performing the services and adequately discharging the functions and producing the final results and purposes said facilities are intended to perform, discharge or produce. The District may, in its sole discretion, make repairs to any portion of a building sanitary service located within a public right-of-way or public easement which is found during District investigations to allow the entry of extraneous materials or flows into the public sanitary sewer or to pose a health or safety hazard to the general public and the District may seek reimbursement for the costs of any such repairs from the owner of the premises served by said building sanitary service.

Section 4.2. All downspouts or roof drains shall discharge onto the ground or be connected to storm sewers, drainage ditches or storm drainage systems. Footing drains shall be connected to sump pumps and discharge shall be made into storm sewers, drainage ditches or storm drainage systems. Sump pumps installed to receive and discharge ground waters or other storm water shall be connected to storm sewers or discharge onto the ground or into a drainage ditch or storm drainage system through a rigid discharge pipe, without any valving or quick connections for altering the path of discharge. Sump pumps installed to receive and discharge floor drain flow, laundry tubs or other wastewater shall be connected to the sanitary sewers pursuant to this ordinance. A sump pump shall be used for one function only, either the discharge of storm waters or the discharge of wastewater.

Section 4.3. The Manager shall cause to be made periodic visual outside inspections of all properties within the District, with specific attention to downspouts, roof drains and other visible or outside connections and shall request the property owner or property occupant to permit entry into the premises for the making of additional inspection of the premises to ascertain if illegal connections are present. Upon completion of the visual outside and inside inspection, the Manager will advise the property owner, in writing, if any illegal connections are observed, and will advise on the matter of corrections for compliance with the provisions of this ordinance. If corrections are

to be made, the District will, at no expense to the owner, make further inspection of the corrections to insure compliance with this ordinance.

Section 4.4. If entrance to property is denied an employee or agent of the District, the Manager shall serve notice requiring, within a period of 30 days, a written affidavit by a Licensed Professional Engineer that the sanitary sewer system of the subject property complies in all respects to the requirements and specifications of this ordinance and that no storm water, surface water, ground water, roof runoff water, sub-surface drainage, runoff water from ground or paved areas, cistern overflow or water from air-conditioning systems, industrial cooling operations, or any flows other than wastewater are discharged into the sanitary sewer system from the subject property. In the event the property owner fails to provide the aforementioned affidavit within 30 days, the Manager shall commence action to terminate sanitary sewer service to the property remaining in non-compliance.

Section 4.5. In the event any property is in non-compliance with the provisions of Subsection 4.3 or 4.4 after the 30 day notice, that property shall be deemed continuing in non-compliance until there is paid to the District a sum in United States currency equal to all costs incurred by the District, including but not limited to clerical costs, mailing costs, service fees, attorneys fees, court costs, and all other reasonable fees and expenses incurred in commencing action to terminate the sanitary sewer service to the property or in terminating or restoring sanitary sewer service to the property in non-compliance.

Section 4.6. In addition to visual inspections on the outside and inside of the premises, the District may make other lawful tests and inspections of the sanitary sewer system as it deems necessary in order to locate such illegal connections and sources of extraneous flows as may exist. The District, at its option, may also invoke other legal powers vested in it or implied by the Illinois Compiled Statutes for the protection of the health and welfare of the public, and institute such legal action as it deems necessary to discover and order the disconnection of any illegal connections that may exist.

APPLICATION FOR PARTICIPATION IN
DOWNERS GROVE SANITARY DISTRICT
PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL PROGRAM

I/We hereby request participation in the Downers Grove Sanitary District Private Property Infiltration and Inflow Removal Program, hereinafter called the "Program."

I/We own, and this application is for, the following described property:

Address: _____

_____

Legal Description: _____

_____

_____

Parcel Number (P.I.N.): _____ (You may obtain the Parcel Number (P.I.N.) for your property from your real estate tax bill.)

I/We have received a copy of the Program Requirements attached to and made a part of this application.

I/We agree to allow the Downers Grove Sanitary District or its representatives to make any and all inspections and testing as detailed in the Program Requirements.

I/We have received sample copies of the Agreement for Private Property Infiltration and Inflow Removal and the Access Agreement and understand that said Agreements must be signed in order to participate in the Program.

Dated this _____ day of _____, 20___.

OWNER(S)

_____ _____
Printed Name Signature

_____ _____
Printed Name Signature

_____
Telephone Number

NOTE – If this property is held in a land trust, please submit a copy of the trust agreement *or* a certificate from the trustee of the trust which discloses all beneficiaries having any interest in this property, states that the trust is in full force and effect, that the trust currently owns the property and the trustee signs and dates the letter. If any of these beneficiaries are a corporation, the identity of all corporate shareholders must also be disclosed.

SAMPLE - DO NOT SIGN AT THIS TIME

AGREEMENT FOR PRIVATE PROPERTY INFILTRATION AND INFLOW REMOVAL

This Agreement is made this _____ day of _____, _____, by and between the Downers Grove Sanitary District ("District") and _____ ("Owners") of the premises located at:

Address: _____

_____

Legal Description: _____

_____

_____

_____

P.I.N.: _____

Whereas, the District has a program for the removal of infiltration and inflow sources on private property, and

Whereas, the District has conducted an evaluation of the property described above, including appropriate tests and inspections, in accordance with District ordinances, and

Whereas, the Owners and the District agree that there are connections on the subject property which discharge storm water, surface water or ground water into the sanitary sewer system of the District, and

Whereas, the Owners and the District desire to correct such illegal connections in accordance with the District's Private Property Infiltration and Inflow Removal Program ("Program").

Now, therefore, in consideration of the mutual covenants contained herein, the District and the Owners hereby agree to the following terms and conditions:

1) Owners have read and understand the program requirements attached to and made a part of this agreement.

2) The Owners agree to allow District employees, engineers, contractors and agents reasonable access to the subject property for the completion of all work required under the Program.

3) Upon compliance of Owners with all terms and conditions as stated in the program requirements, the District agrees to pay for all eligible work required under the Program.

4) The Owners agree that if they fail to comply with all terms and conditions as stated in the program requirements, they shall be liable to the District for any and all costs incurred by the District for any work performed at the subject premises in the course of correcting illegal connections.

5) The Owners agree to retain ownership and operation, maintenance and replacement responsibility for all sump pumps, piping, connections and appurtenances which may be installed under this program and nothing contained herein shall transfer ownership or operation, maintenance or replacement responsibility for these facilities to the District.

6) The Owners agree to retain ownership and maintenance responsibilities for the building sanitary service serving the subject property and nothing contained herein shall transfer ownership or maintenance responsibilities of the building sanitary service to the District.

7) Owners agree to release and waive any claim, suit or liability and to indemnify and hold harmless the Downers Grove Sanitary District, its trustees, officers, employees, engineers and agents, from and against all liability, damage, loss, claims, demands and actions of any nature whatsoever which arise out of or are connected with, or are claimed to arise out of or be connected with the undersigned's participation in this program. This covenant shall include, but not be limited to, any consequence of the inspection of the premises, selection of the system installed or the contractor utilized, installation of the system, operation, maintenance or failure of the system once it is installed, or eligibility for, participation in or funding priority in the Program.

8) Owners state that they are the owners of the premises listed above and that they have read and understand this Agreement.

DOWNERS GROVE SANITARY DISTRICT OWNER(S)

_____ _____

Lawrence C. Cox, General Manager

_____

SAMPLE - DO NOT SIGN AT THIS TIME

PREPARED BY:
Michael C. Wiedel, Attorney
4915 Main Street
Downers Grove, IL 60515

SAMPLE - DO NOT SIGN AT THIS TIME

BUILDING SANITARY SERVICE ACCESS AGREEMENT

In consideration of good and valuable consideration, receipt and sufficiency of which are hereby expressly acknowledged, _____ and _____ (hereinafter referred to as "Grantors"), legal owners of the below described property, hereby warrant, grant and convey to the DOWNERS GROVE SANITARY DISTRICT, a body politic and corporate of DuPage County, Illinois, (hereinafter referred to as "Sanitary District") its engineers, contractors, agents, successors and assigns, the right to inspect, test, measure flows or otherwise monitor each underground building sanitary service and the right of access thereto, in, upon, under, over, through and across the land over each building sanitary service from the property line to each building located on the following described property:

P.I.N.: _____

Common Address: _____

The access for said building sanitary service, herein granted, is subject to the following terms and covenants, which the Sanitary District expressly acknowledges, undertakes and agrees to fulfill, to-wit:

1. This access shall not unreasonably interfere with the use and enjoyment of the Grantors' property, by the Grantors, its successors and assigns.

2. In the event that a building sanitary service requires repair, reconstruction, rehabilitation or replacement, Grantors agree to cooperate with the Sanitary District to allow reasonable additional access for such work. The responsibility for the repair, reconstruction, rehabilitation or replacement shall be governed by ordinances of the Sanitary District in effect as of the date of this agreement and as subsequently amended from time to time.

3. If the surface of the subject property is disturbed by the Sanitary District, its engineers, contractors, agents, successors or assigns, at any time, and from time to time, by the inspection, testing, reconstruction, rehabilitation, repair or replacement in connection with said building sanitary service, the Sanitary District shall, at its sole cost and expense, repair and restore any disturbed property to substantially the same condition that existed immediately prior to such disturbances, including, without limitation, necessary repairs and replacement of paving and landscaping.

4. Grantors agree that the operation and maintenance of said building sanitary service shall be governed by ordinances of the Sanitary District in effect as of the date of this agreement and as subsequently amended from time to time.

The Sanitary District, as a condition of rights granted to it by this agreement, hereby agrees to protect, indemnify and hold the owners of the above described property harmless from and against any and all claims, demands, causes of action, losses, suits, liabilities, judgements and decrees relating to the use of this access agreement, and the costs and expenses (including attorney's fees) incident to the defense of and by such owners, in any manner caused by, resulting from, growing out of, connected with, or in any way attributable to its use of this access agreement.

"Grantors" do hereby warrant that they are the legal owners of the above described property. "Grantors" when used herein is intended to refer to the holder or holders from time to time of title to the Tract and to any portions thereof. All provisions of this Agreement, including the benefits of burdens, are hereby declared to run with the land and shall be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto, as well as, the future owners of any

part of the land subject to any easements created hereby. This agreement will be recorded with the DuPage County Recorder of Deeds to serve as notice to future owners of the subject property.

For the consideration expressed herein, the Sanitary District joins in the execution of this document for the purpose of accepting, consenting and agreeing to the terms and obligations contained in this agreement.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed as of this _____day of _____, 20___.

DOWNERS GROVE SANITARY DISTRICT

_____

SAMPLE - DO NOT SIGN AT THIS TIME

BY: _____
General Manager

_____

ATTEST: _____
Assistant Clerk

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

I, the undersigned, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that _____ and _____, personally known to me to be the same persons whose names are subscribed to the foregoing instrument appeared before me this day in person and acknowledged that they signed and delivered the said instrument as their own free and voluntary act for the uses and purposes therein set forth.

GIVEN under my hand and official seal this _____day of _____, 20___.

_____
Notary Public

Prepared By: Michael C. Wiedel, 4915 Main Street, Downers Grove, Illinois 60515
Mail To: Downers Grove Sanitary District, 2710 Curtiss Street, Downers Grove, Illinois 60515

APPENDIX K
PUBLIC INVOLVEMENT INFORMATION

Public Meeting Notice

Workshop 1 – Hopes, Fears, and Prioritization
Forest Park Area Sanitary and Storm Sewer Study

Public Workshop Planned
The City of Kenosha Stormwater Utility and Water Utility have combined efforts to address flooding issues in the Forest Park area. The sanitary and storm sewer study will work toward identifying problem areas and in the end providing sustainable options to reduce flooding. The first meeting will be held on **Thursday, September 24, 2009 from 6-7 p.m.** to inform residents about the upcoming study. A short presentation will be given to further explain the study and how residents are an important piece of the solution. The presentation will also provide insight on how stormwater and sanitary problems occur. Following the presentation, residents will be given the opportunity to express their expectations and concerns.

Public Workshop Location
Kenosha Civil War Museum
5400 First Avenue
Kenosha, WI 53140

The facility is wheelchair accessible. Hearing impaired persons needing assistance may call the Wisconsin Telecommunication Relay System at 711. To allow time for arranging assistance, please call no later than three working days prior to the meeting.

Your Involvement
Interested persons are encouraged to attend the interactive meeting to ask questions and provide input as to how they envision the project proceeding. Bring your completed 'Forest Park Area Information Survey,' if not already submitted. If you cannot attend, but would like to receive information about the project, contact the City of Kenosha Assistant City Engineer listed below.

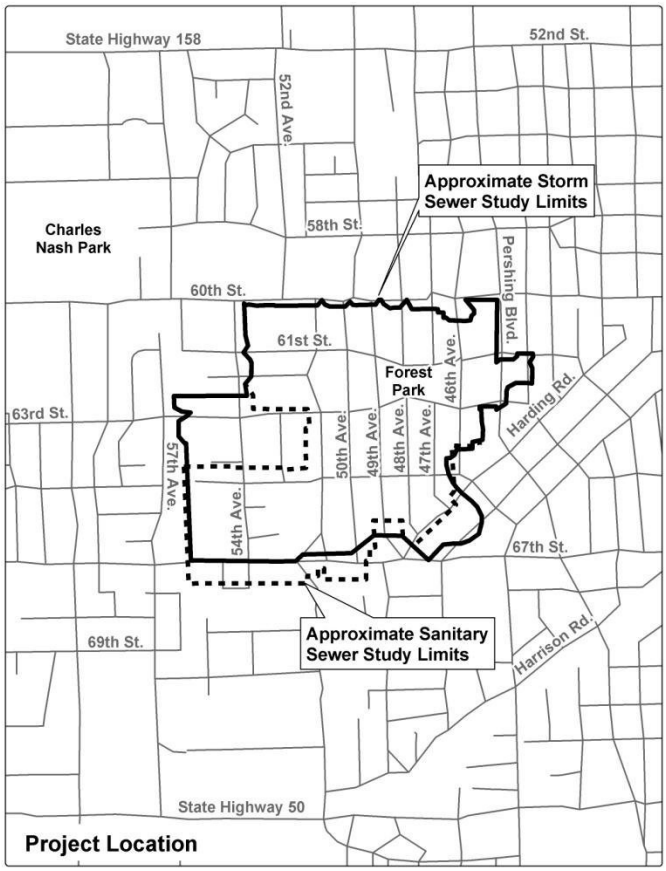
Project Study Limits
The approximate area of study is from 60th Street to 67th Street and from 56th Avenue to Harding Road.

Future Workshops
Building from the foundation established at Workshop 1, additional meetings will be held in the coming months:

Workshop 2 – Solution Development
Workshop 3 – Solution Refinement

Project Contact
For more information about the project, contact Shelly Billingsley, Kenosha Stormwater Utility Assistant City Engineer:

Kenosha Stormwater Utility
625 52nd Street, Room 305
Kenosha, WI 53140
(262) 653-4150
sbillingsley@kenosha.org



WORKSHOP #1 COMMENTS

September 24, 2009

COMMENTS
Melting 6108 51st
6039 46th

FEARS	VOTES
Solution won't work	12
Solution too expensive	0
Higher taxes/fees	3
Ideas and no implementation	1
Solution "relocates" problem	3
Low quality solution	1
Floods before fixed	3
Devalue property	6
Same old solutions	0
Not enough input	0
Apathy	0
Makes things worse	3
Personal cost	0

HOPES	VOTES
No more flooding basements	14
No more flooding in streets	0
Street gutters repaired properly (flow)	1
Use pumps properly	0
Coordination between city departments	0
Quicker response	0
Ability to get information	0
No higher taxes	5
Street reconstruction	0
Long term solution	8
Rerouting of water	0
Not affected by adjacent property	3
Educate community on etiquette	0
Green solutions	0
Green funding	2
Accountability from city	1

Public Meeting Notice

Workshop 2 – Progress Meeting
Forest Park Area Sanitary and Storm Sewer Study

Public Workshop Planned
The City of Kenosha Stormwater Utility and Water Utility have combined efforts to address flooding issues in the Forest Park area. The sanitary and storm sewer study are working towards identifying problem areas and in the end providing sustainable options to reduce flooding. A meeting will be held on **Tuesday, January 26 from 6-7 p.m.** to update residents about progress made on the study. The Consultant and the Utilities have been making a great deal of progress on the study however; with the complexity of the study and its many components the consultant has not yet completed the analysis needed to identify definitive solutions. Staff wants to hold as many informational meetings as possible to ensure that residents are aware of the efforts that have been made, the tentative schedule for upcoming events and to answer any questions or concerns that you may have. Therefore, the goal of this progress meeting is to present the responses from the resident surveys, field work that has been performed and the current progress made on the sanitary and storm sewer analysis. Following the presentation, residents will be given the opportunity to provide feedback on the materials presented.

Public Workshop Location
Kenosha Public Museum
5500 First Avenue
Kenosha, WI 53140

The facility is wheelchair accessible. Hearing impaired persons needing assistance may call the Wisconsin Telecommunication Relay System at 711. To allow time for arranging assistance, please call no later than three working days prior to the meeting.

Your Involvement
Interested persons are encouraged to attend the interactive meeting to ask questions and provide input and feedback. Continued participation from residents will further assist in development of preferred solutions. If you cannot attend, but would like to receive information about the project, contact the City of Kenosha Assistant City Engineer listed below.

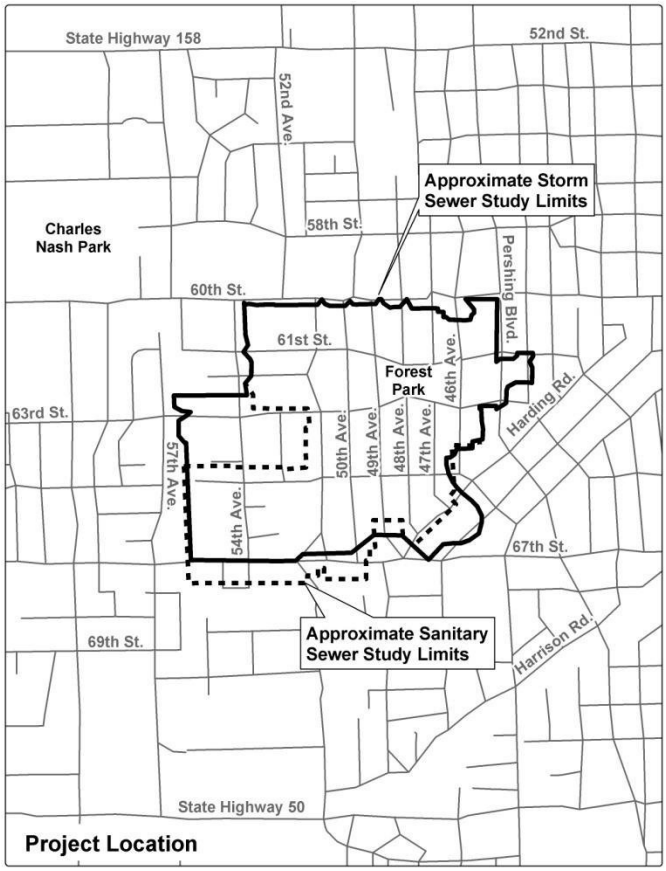
Project Study Limits
The approximate area of study is from 60th Street to 67th Street and from 56th Avenue to Harding Road.

Future Workshops
Building from the foundation established at Workshop 1 and progress presented in Workshop 2, additional meetings will be held in the coming months:

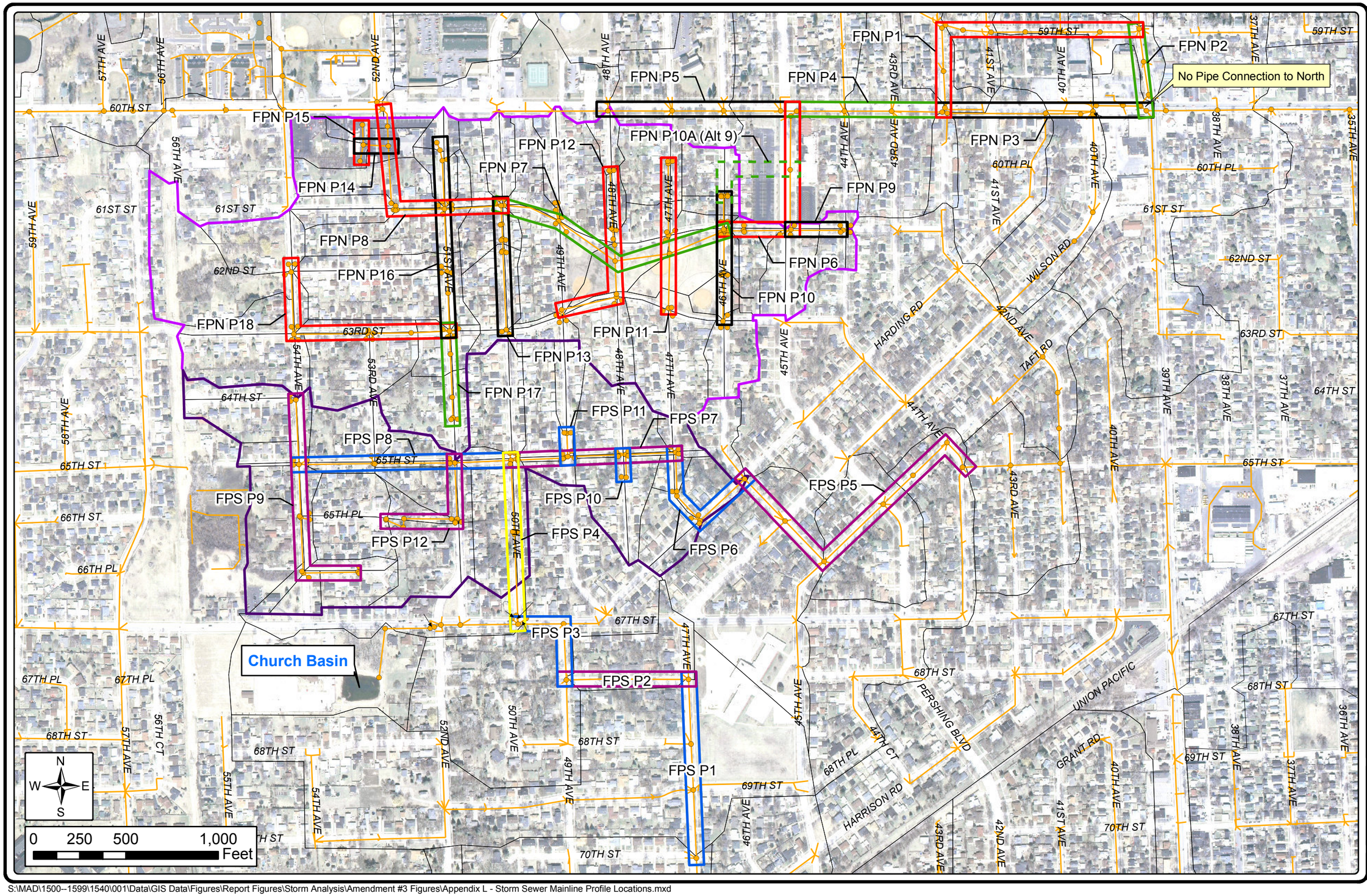
Workshop 3 – Solution Development
Workshop 4 – Solution Refinement

Project Contact
For more information about the project, contact Shelly Billingsley, Kenosha Stormwater Utility Assistant City Engineer:

Kenosha Stormwater Utility
625 52nd Street, Room 305
Kenosha, WI 53140
(262) 653-4150
sbillingsley@kenosha.org



APPENDIX L
EXISTING CONDITIONS 10-YEAR STORM EVENT MAINLINE PROFILES (FOREST PARK NORTH)



STORM SEWER MAINLINE PROFILES
PROFILE LOCATION KEY

FOREST PARK AREA STORM AND SANITARY SEWER MANAGEMENT PLAN
CITY OF KENOSHA
KENOSHA COUNTY, WISCONSIN

STRAND ASSOCIATES, INC.® ENGINEERS

APPENDIX L
1540.001

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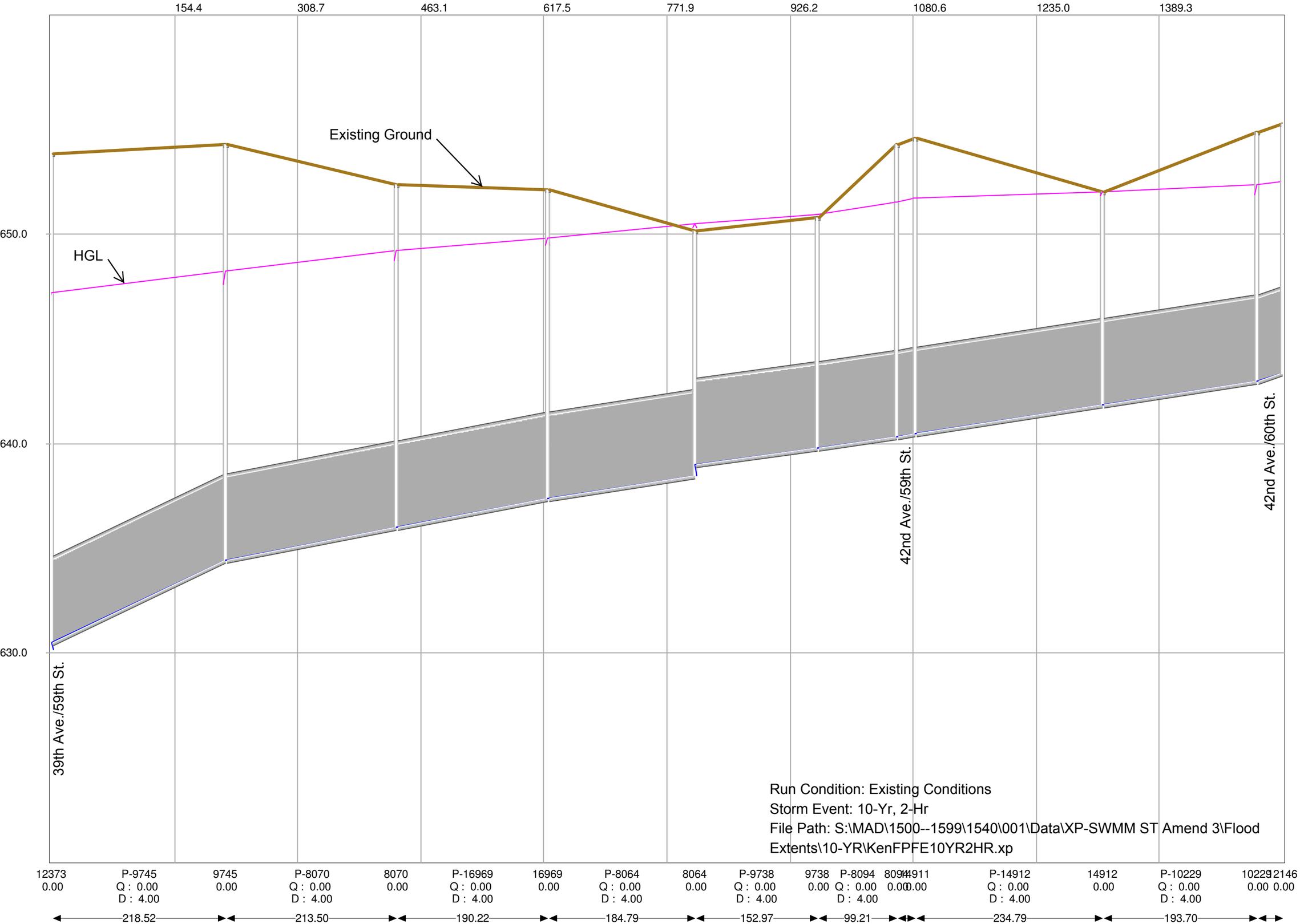

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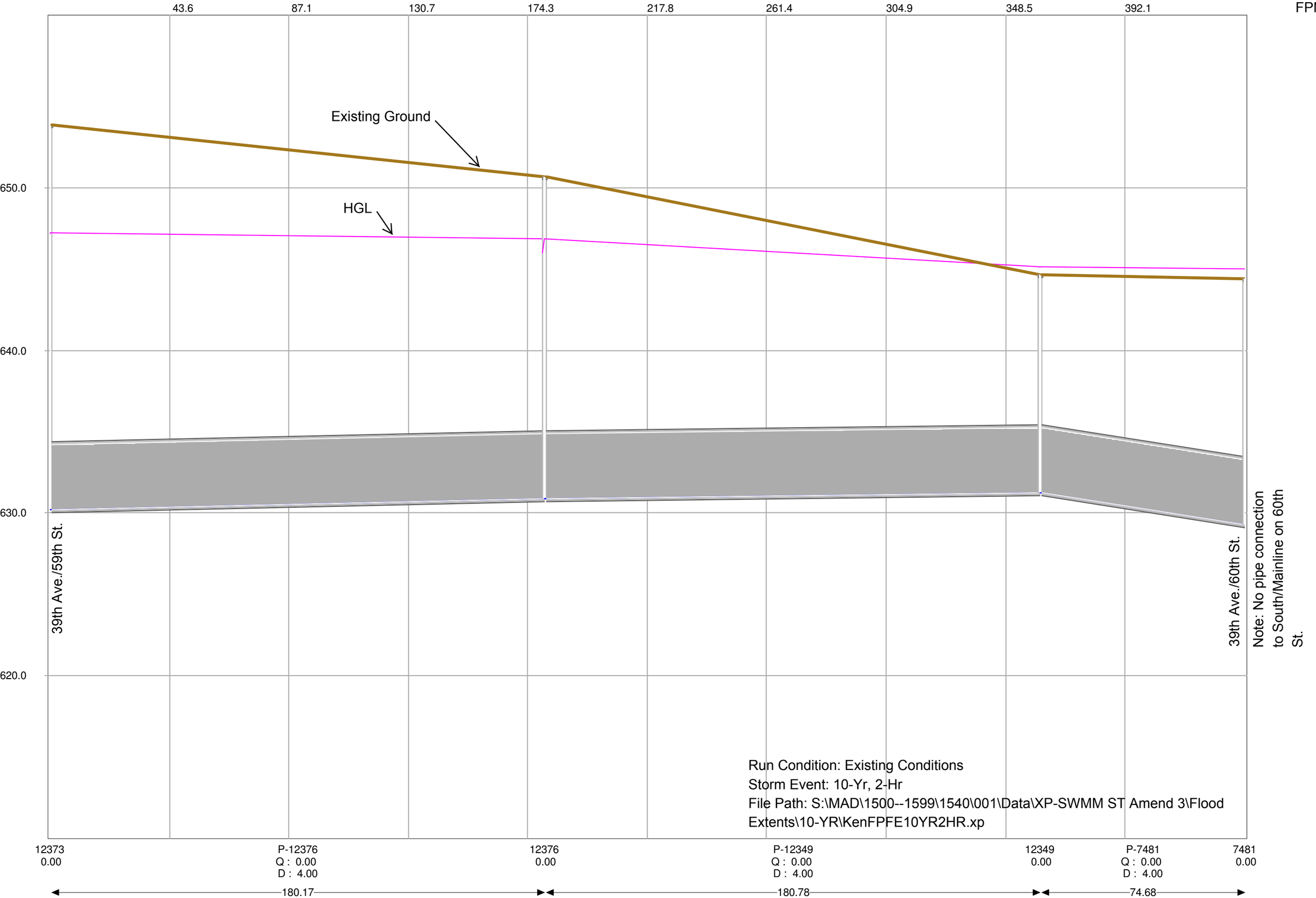

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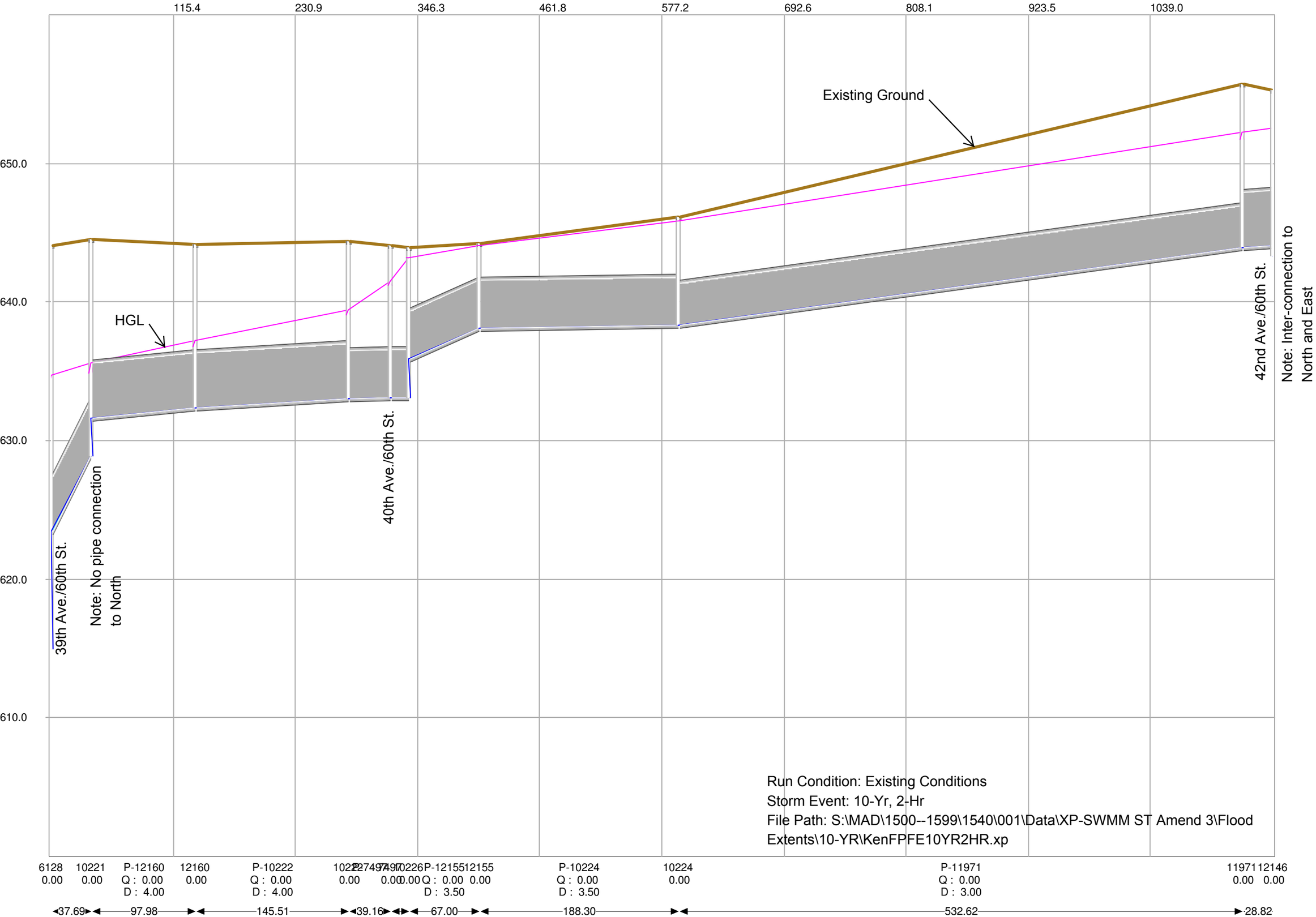

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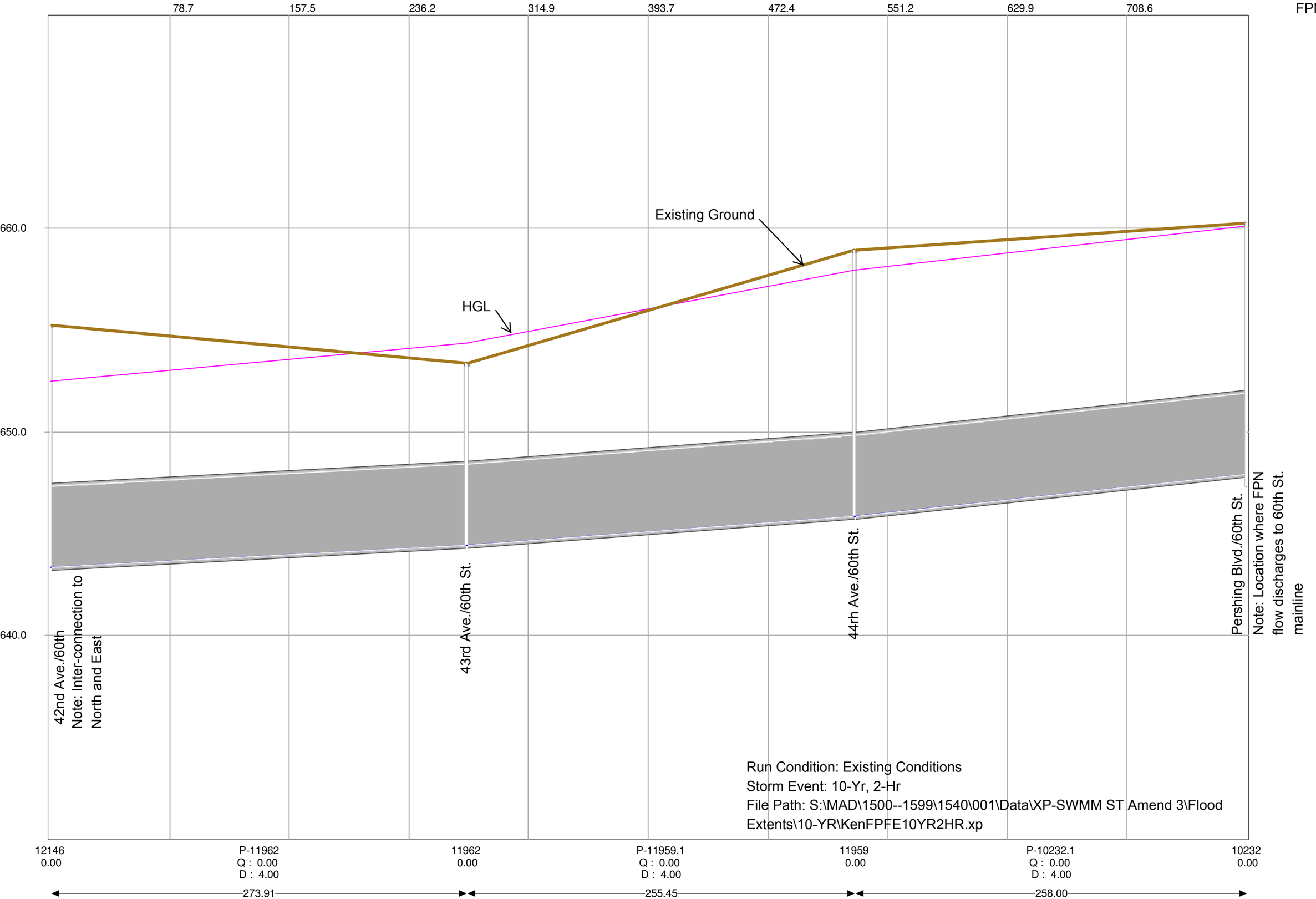

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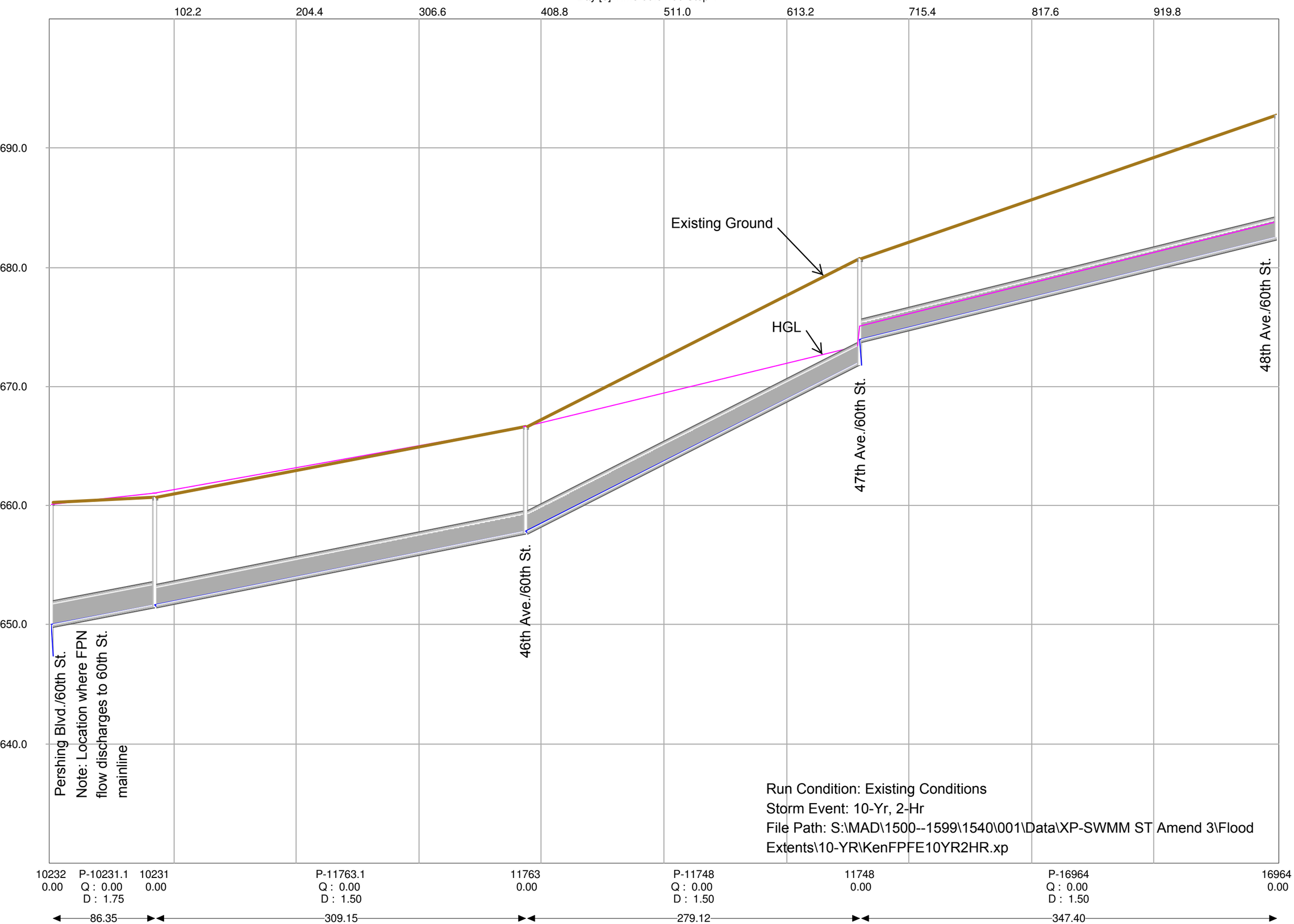

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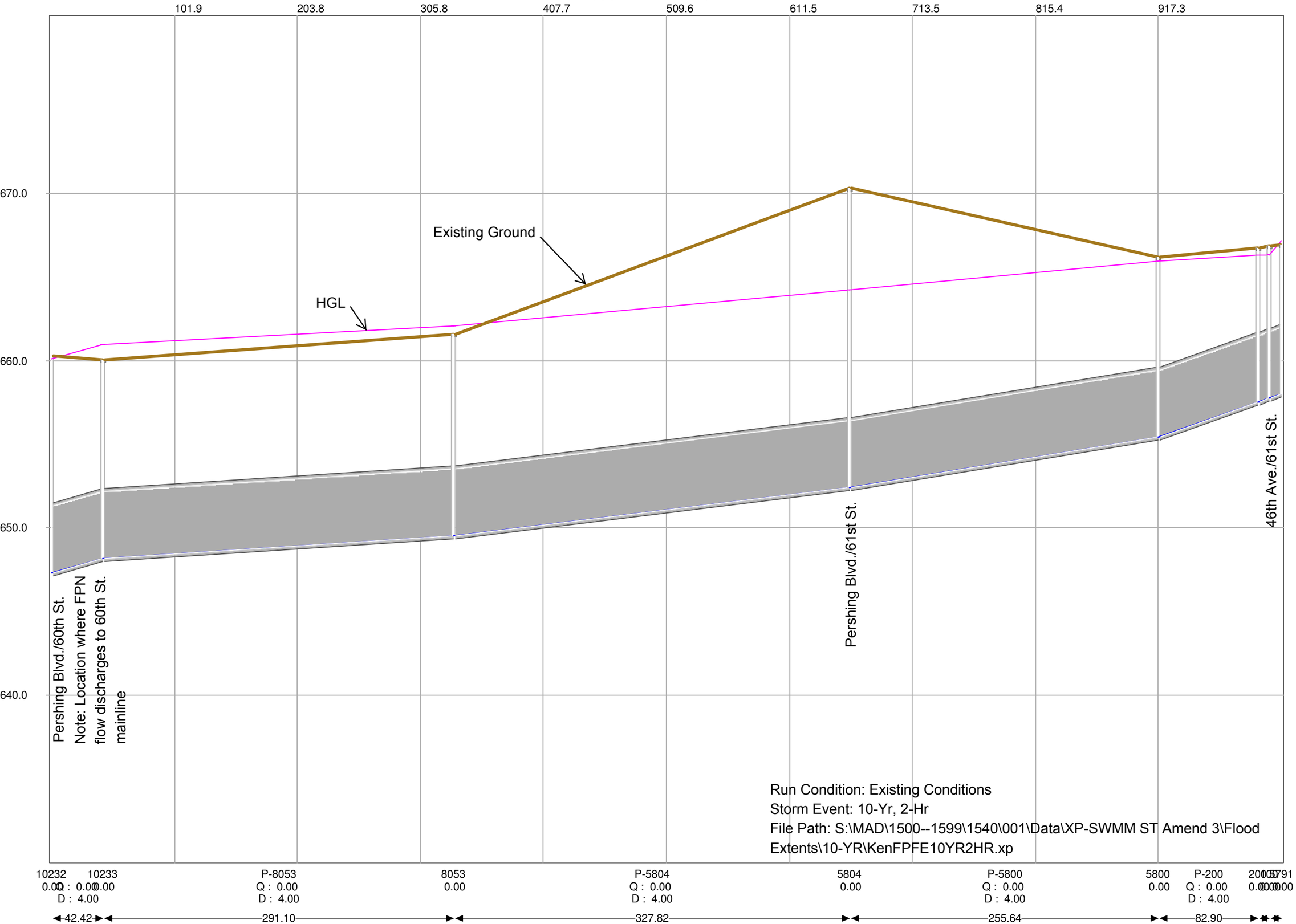

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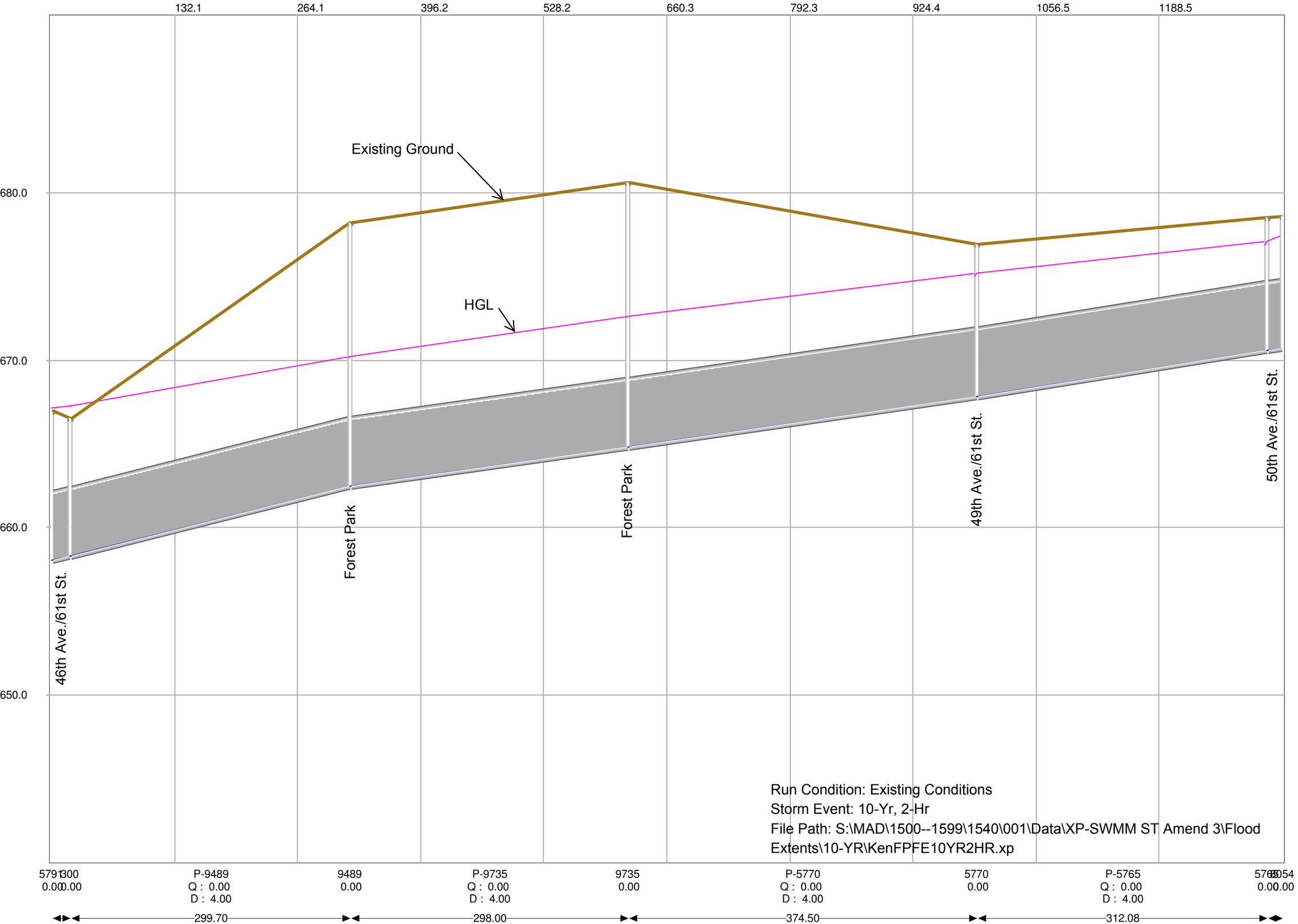

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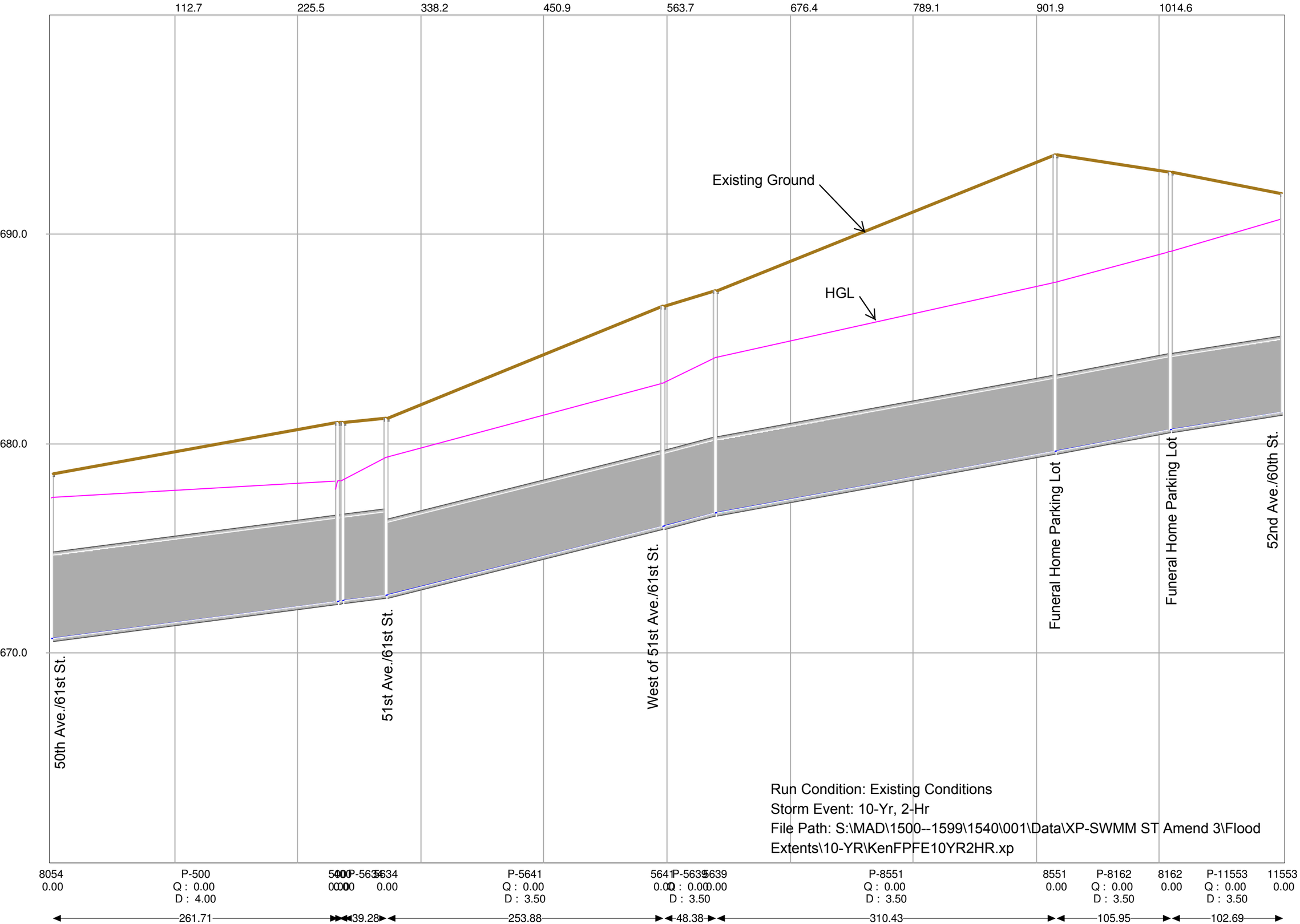

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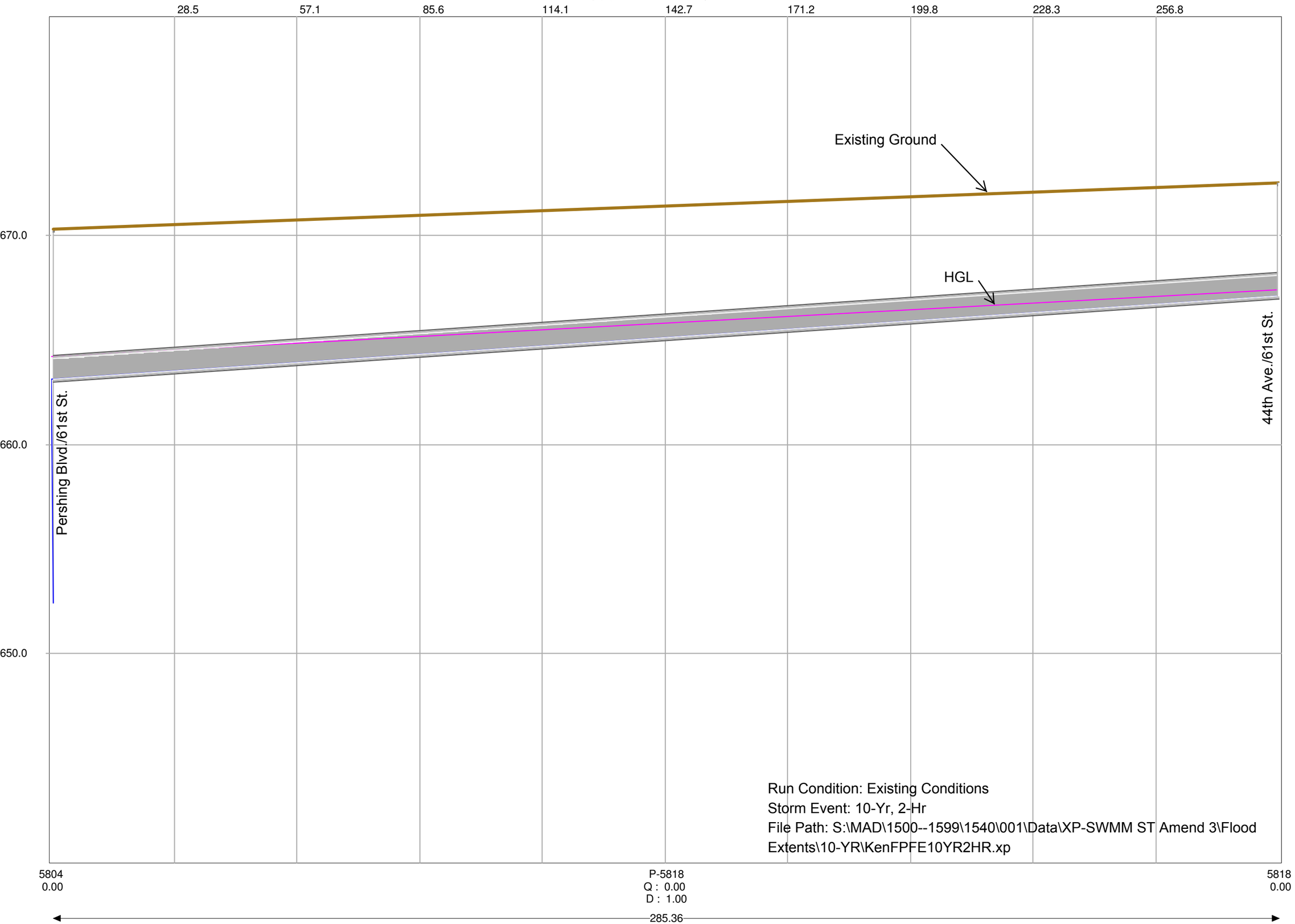

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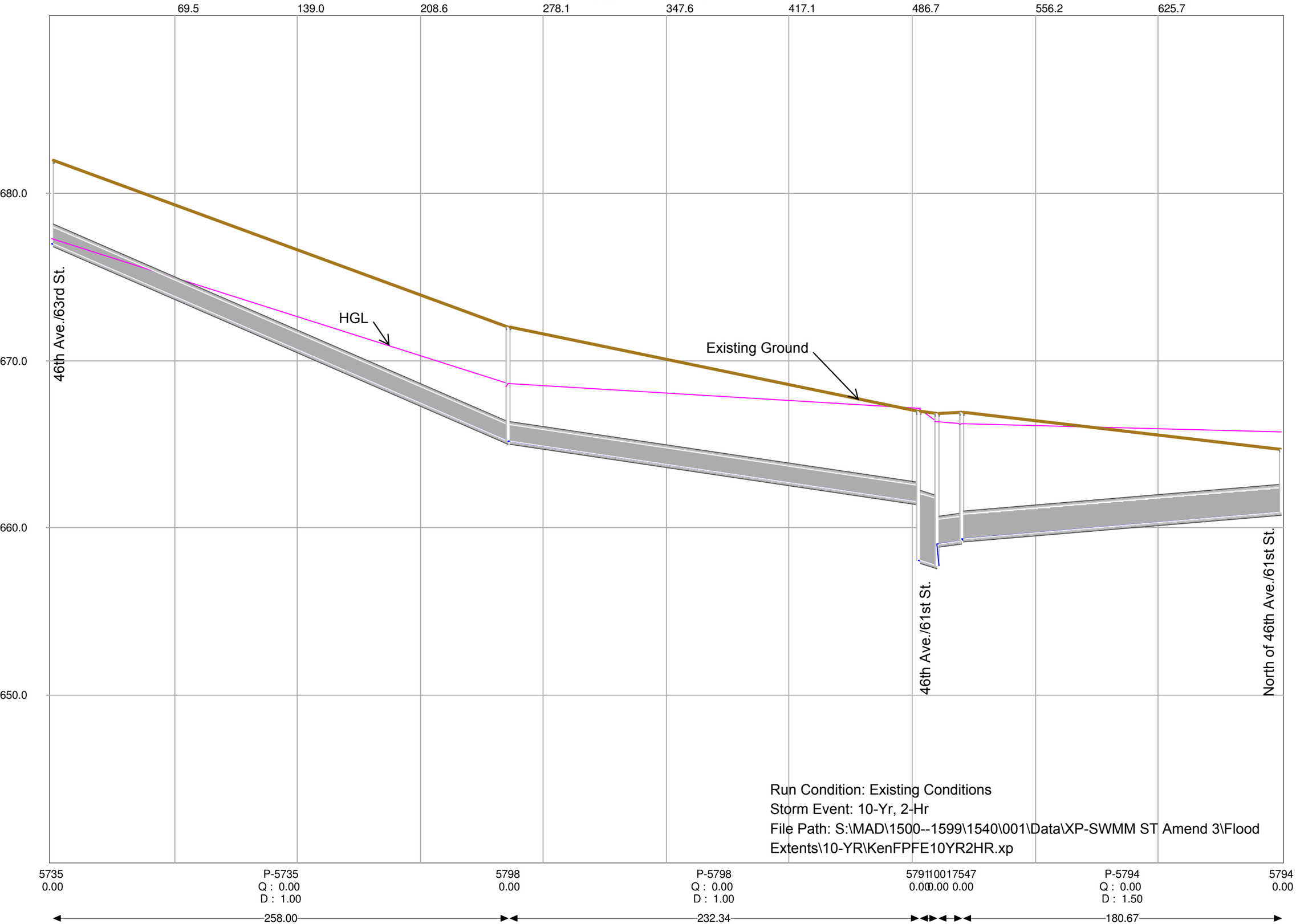

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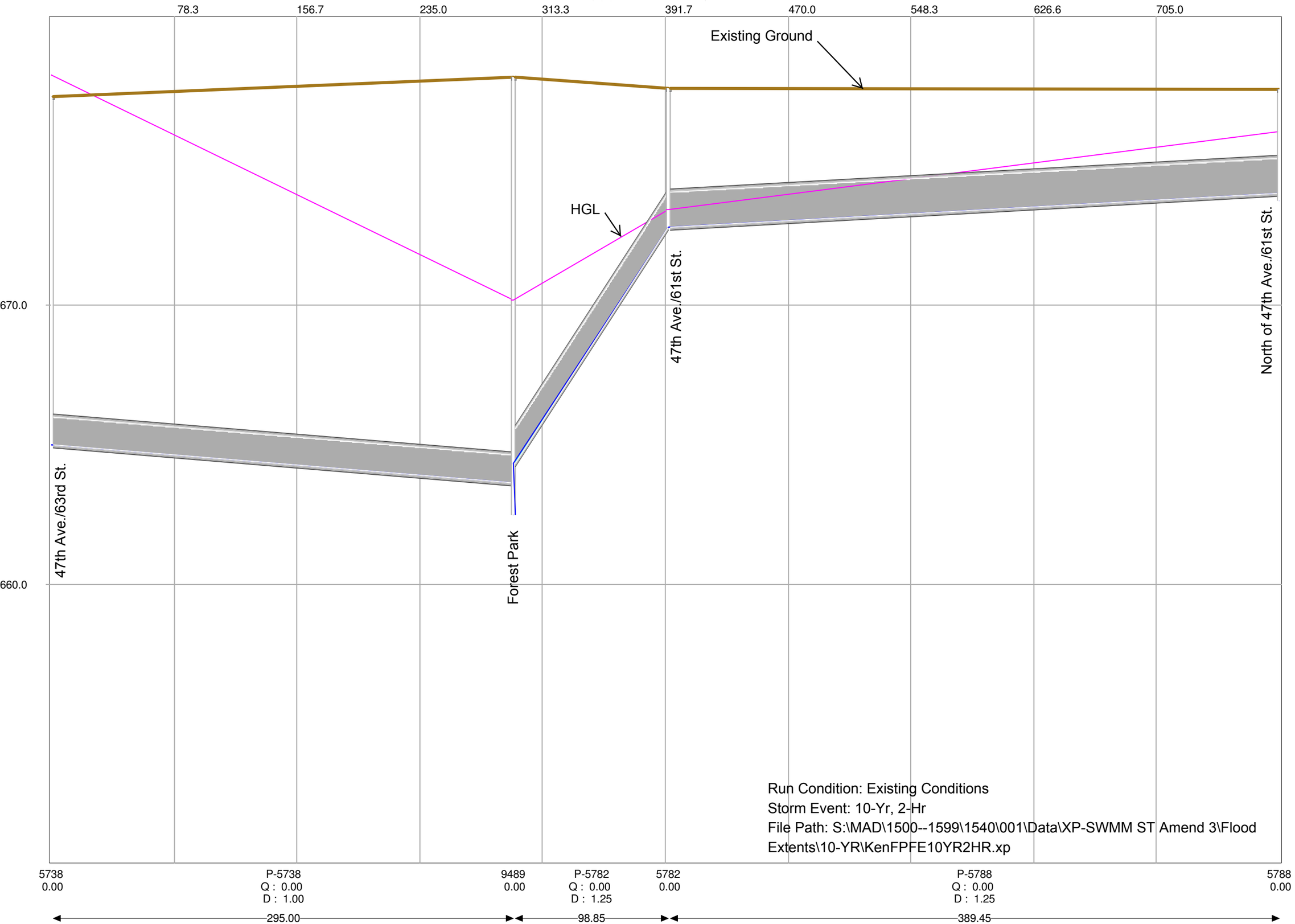

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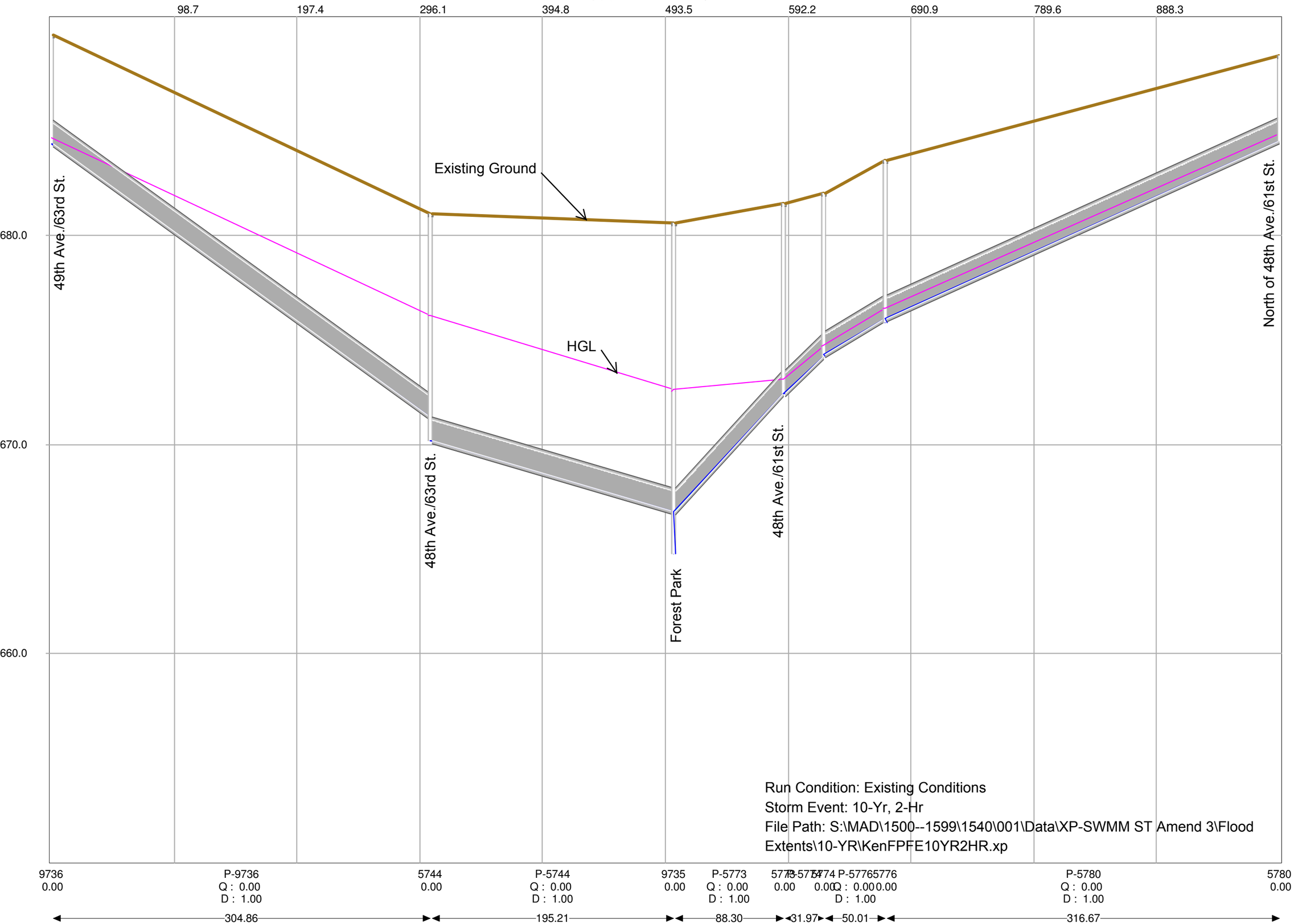

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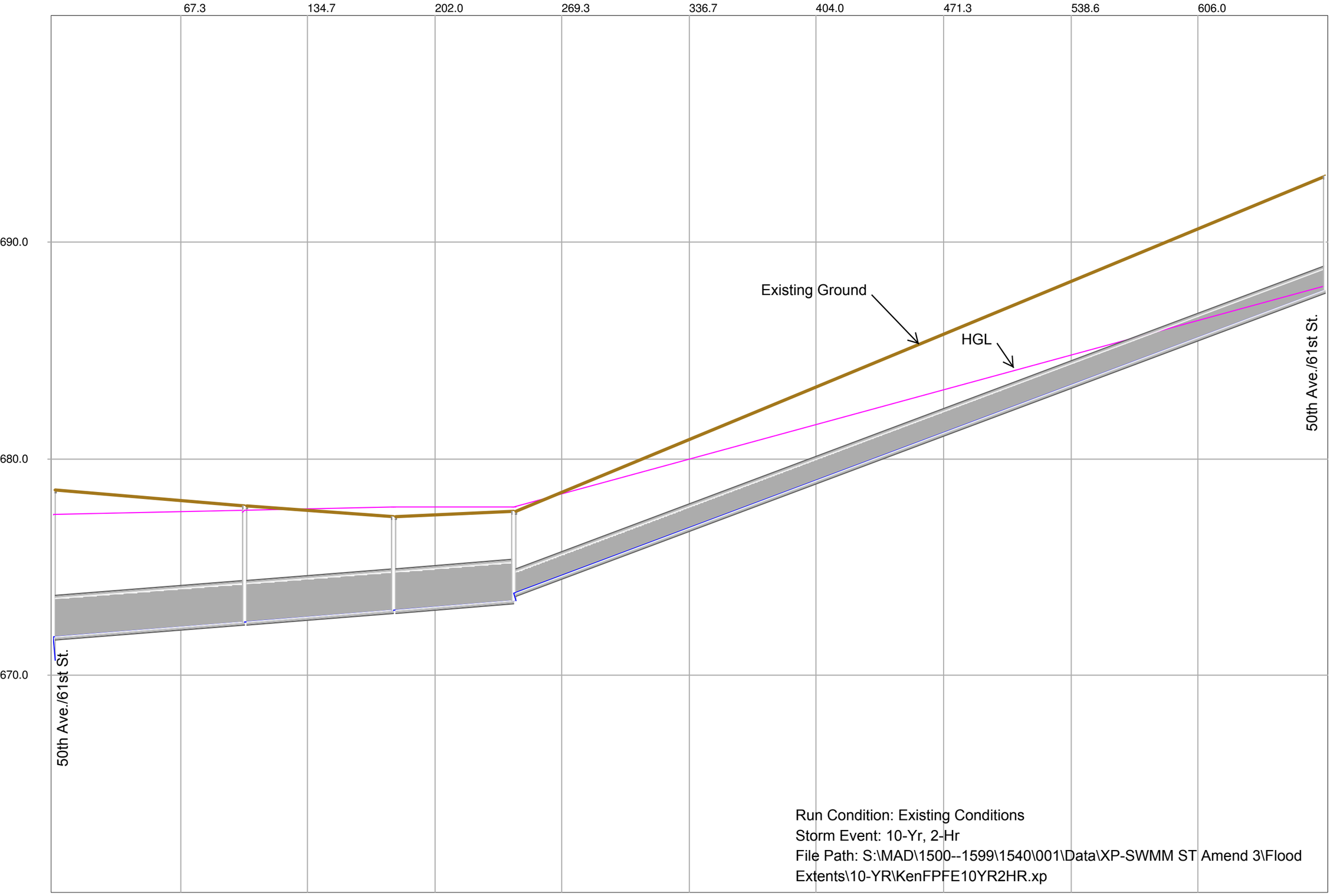

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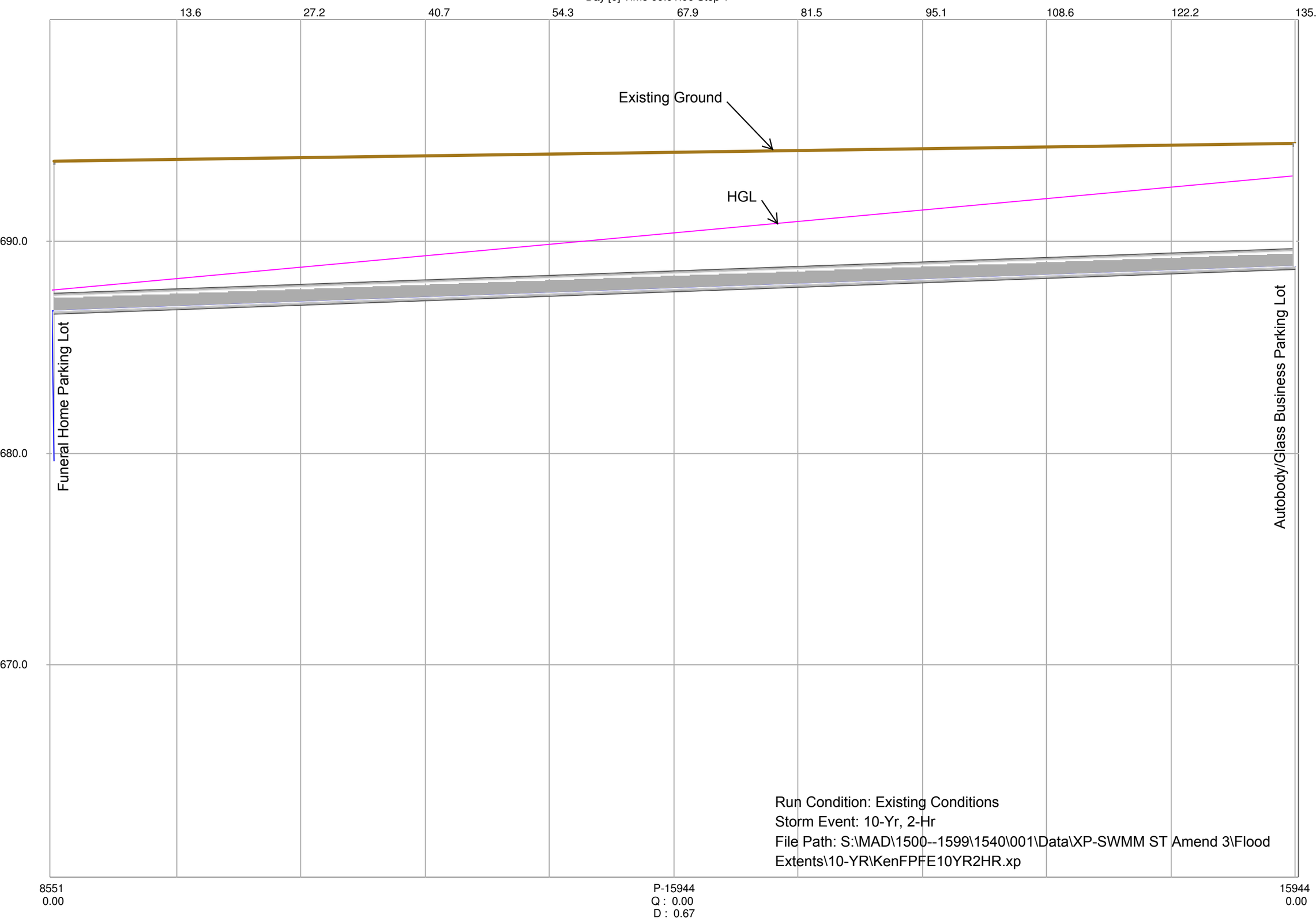

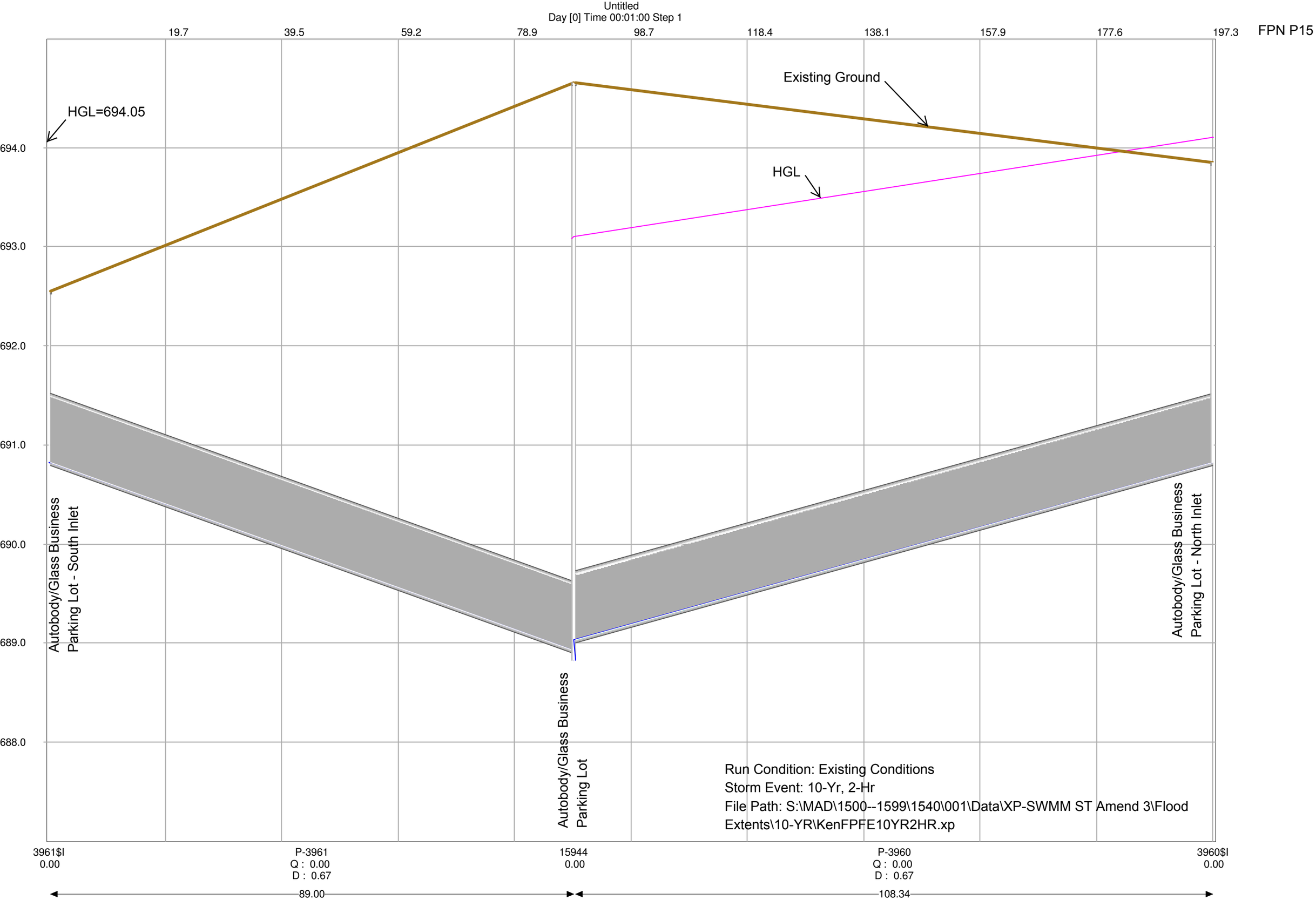
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157.9
177.6
197.3
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693.0
692.0
691.0
690.0
689.0
688.0
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Existing Ground
HGL
Autobody/Glass Business Parking Lot - South Inlet
Autobody/Glass Business Parking Lot
Autobody/Glass Business Parking Lot - North Inlet
Run Condition: Existing Conditions
Storm Event: 10-Yr, 2-Hr
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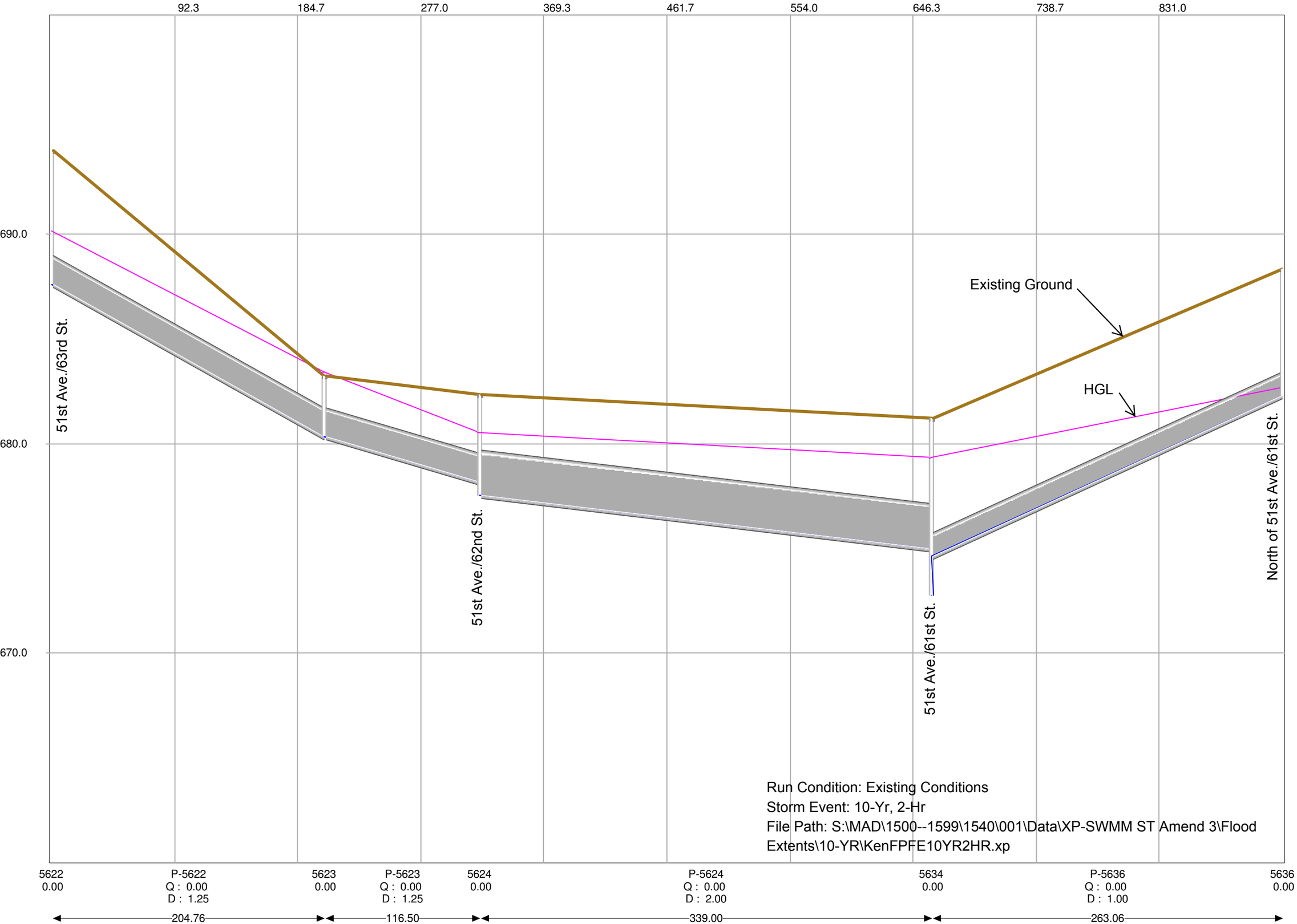

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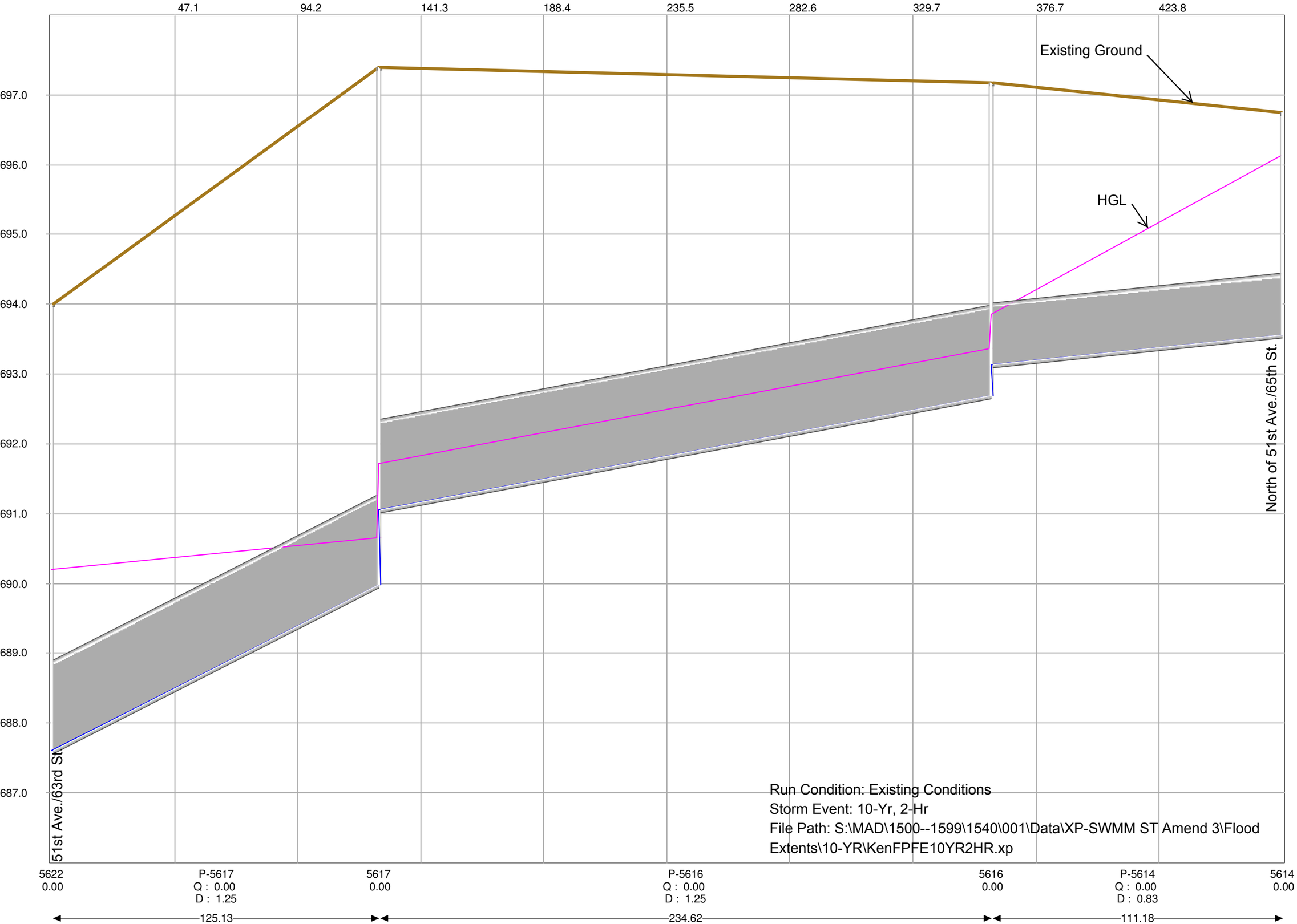

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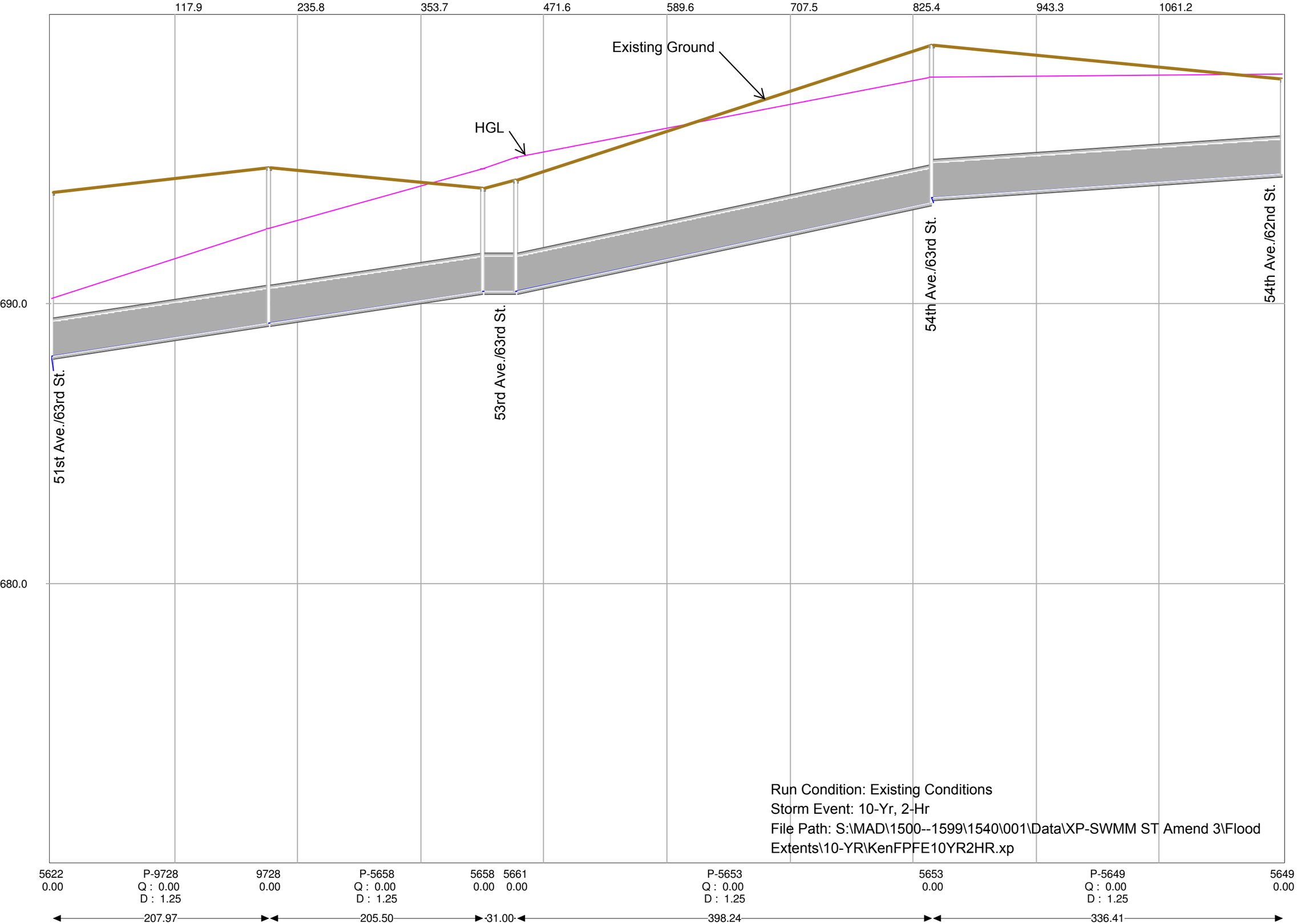

APPENDIX M
EXISTING CONDITIONS 10-YEAR STORM EVENT MAINLINE PROFILES (FOREST PARK SOUTH)

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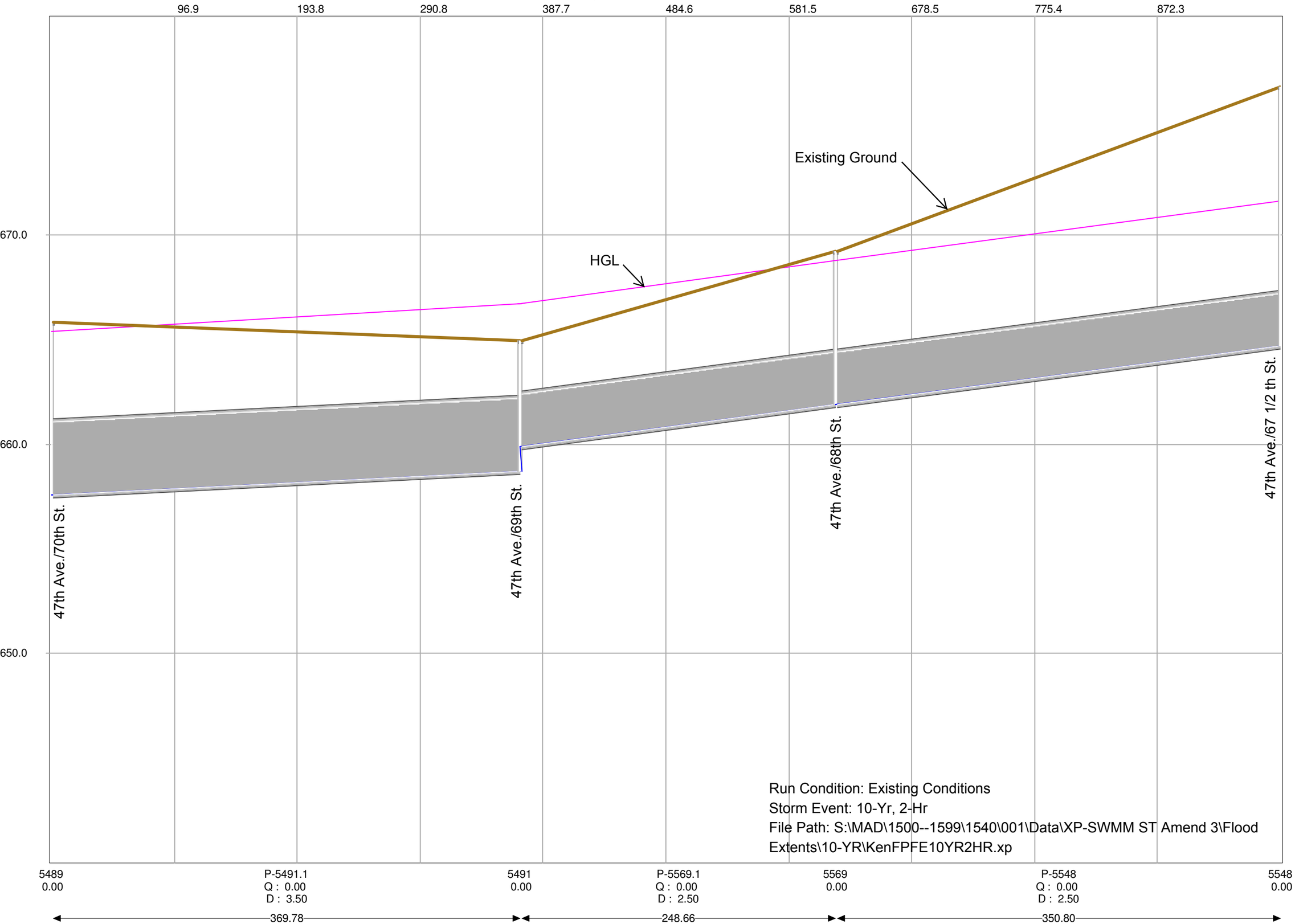

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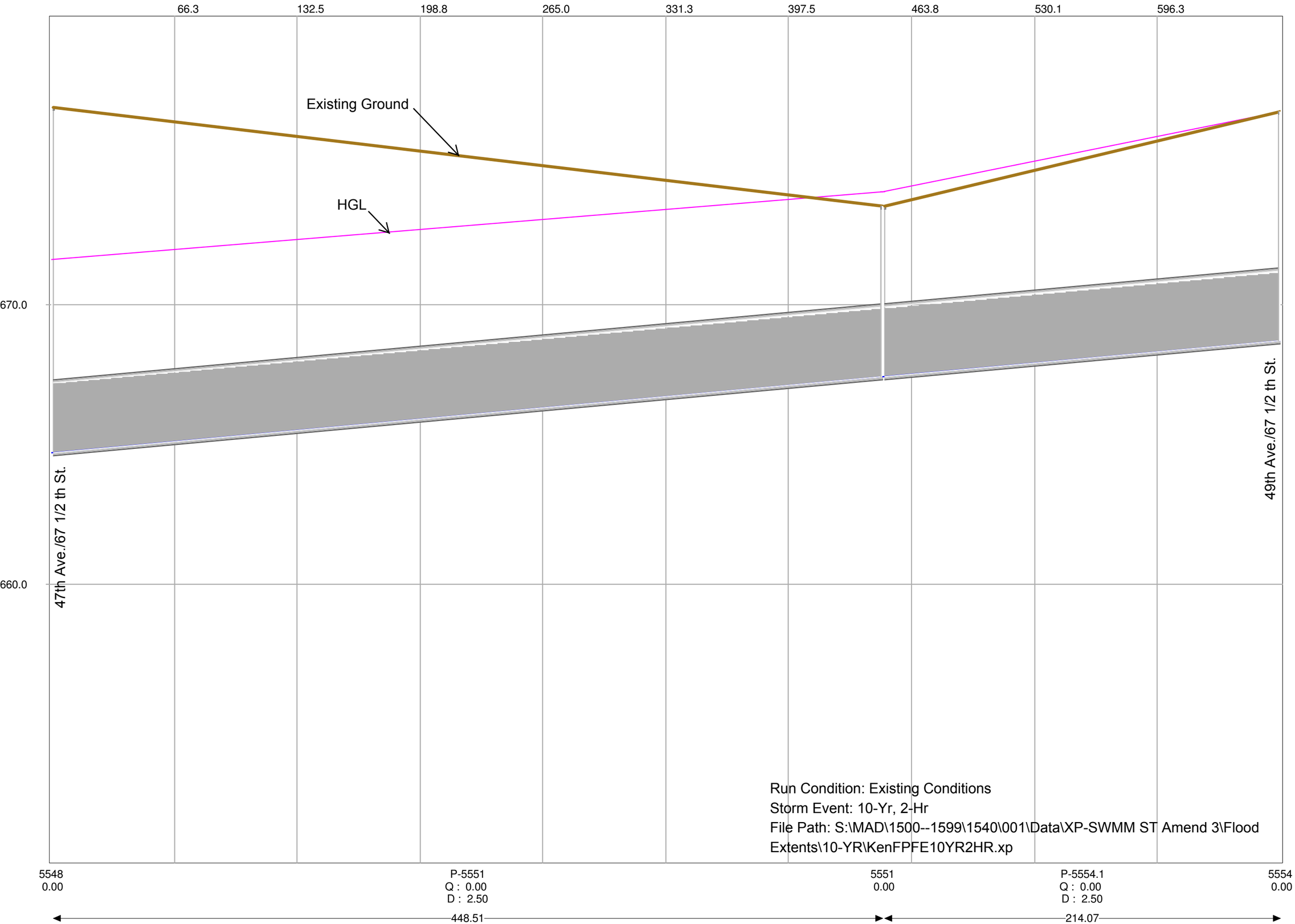

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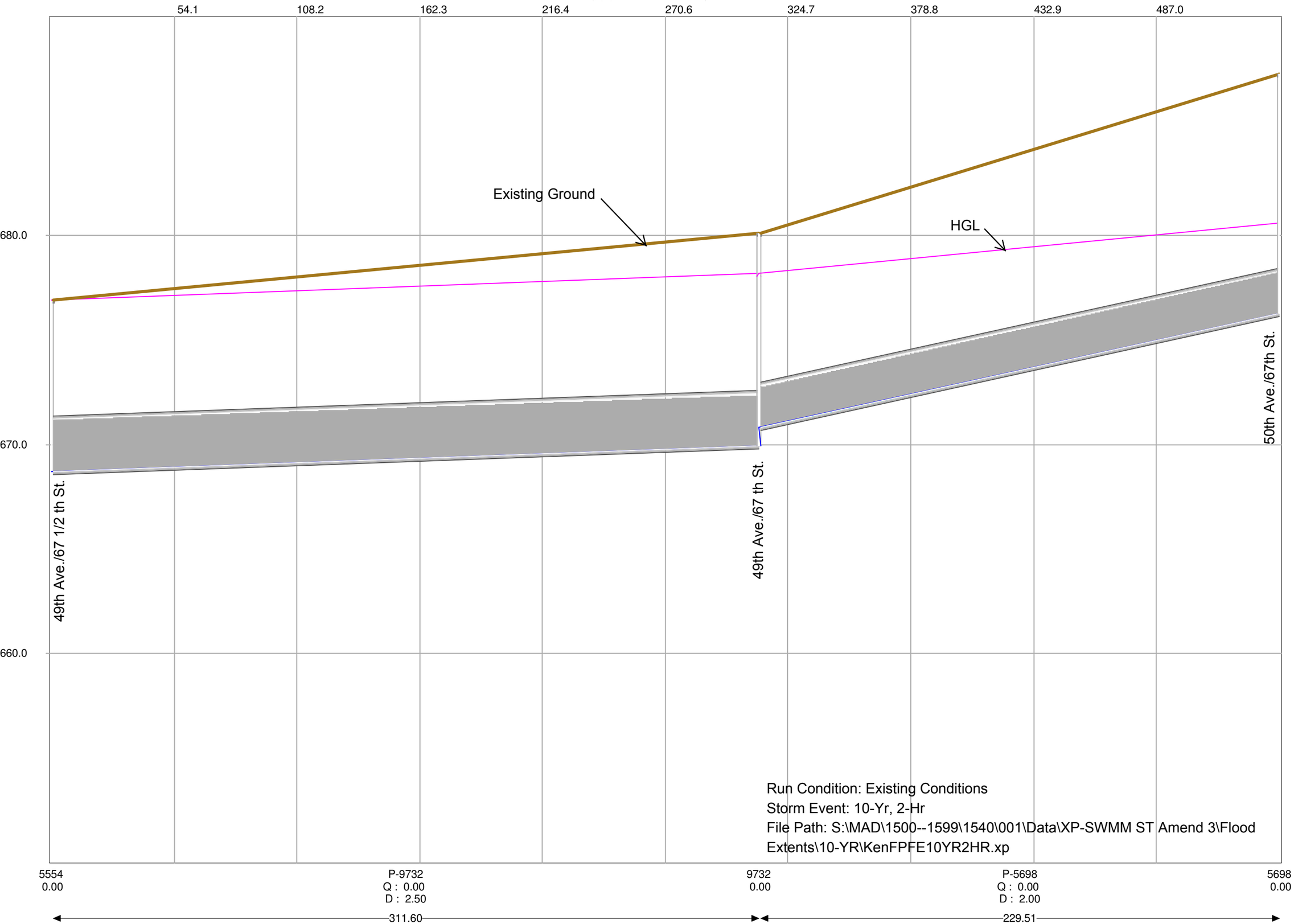

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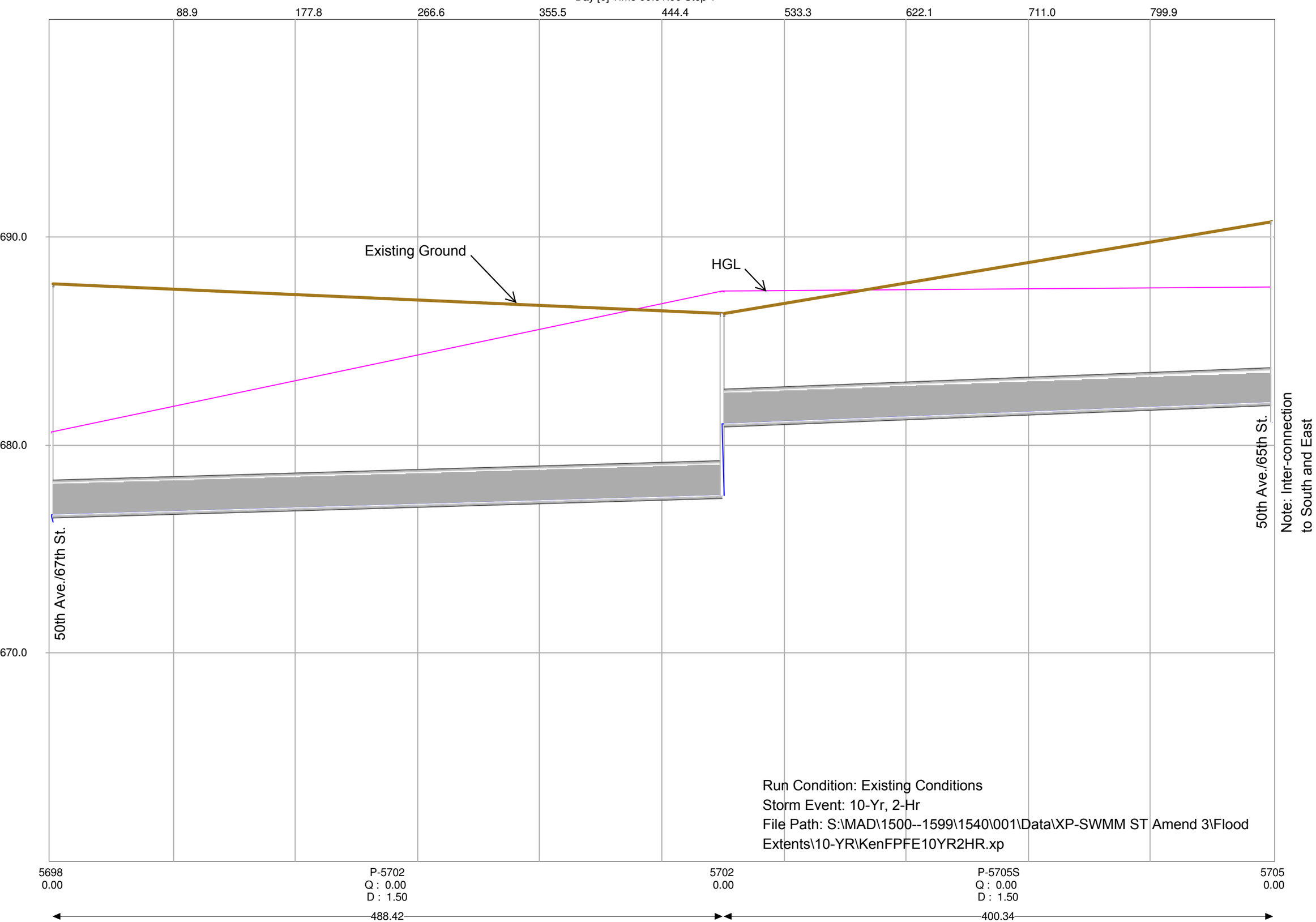
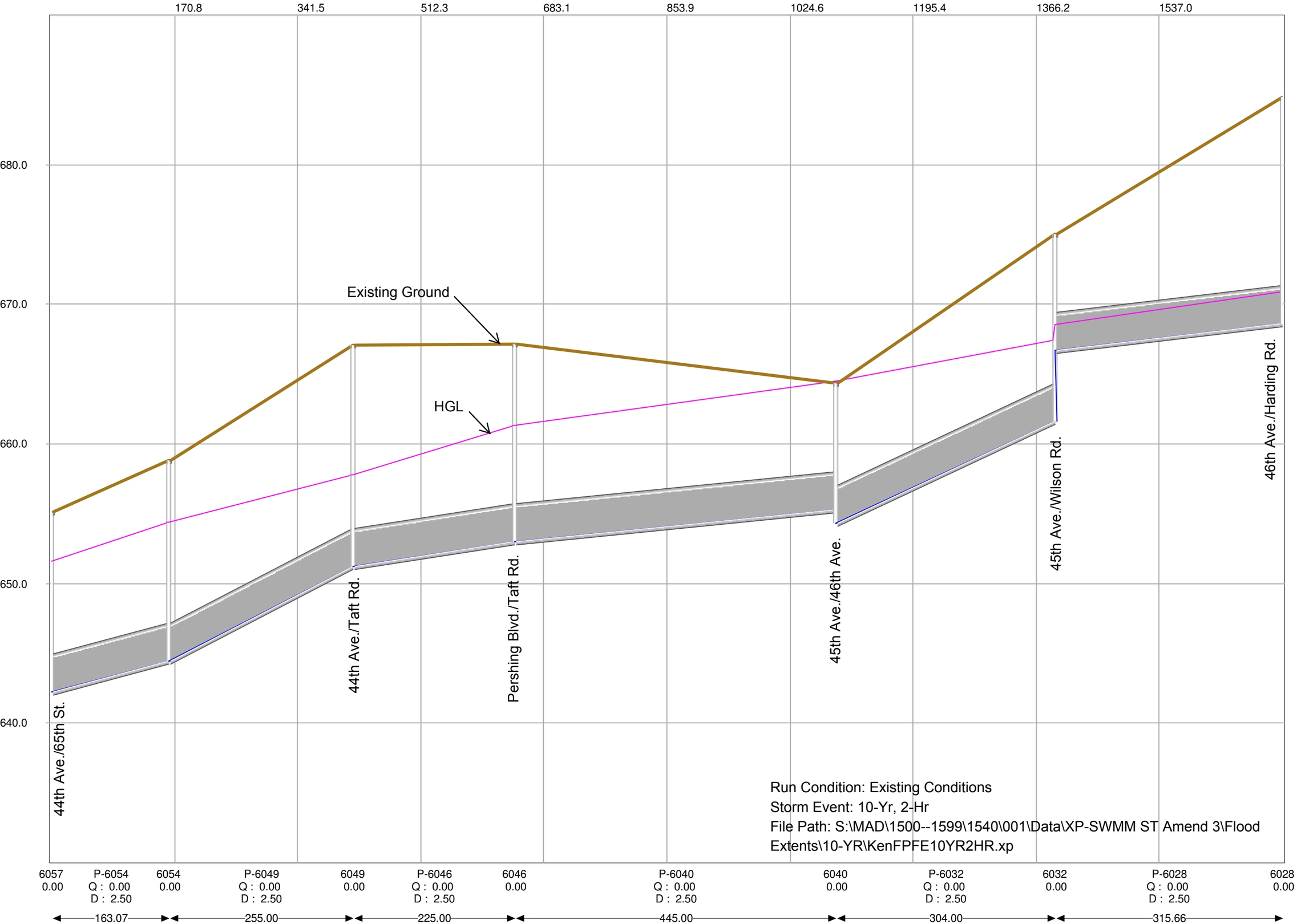
Day [0] Time 00:01:00 Step 1

FPS P4



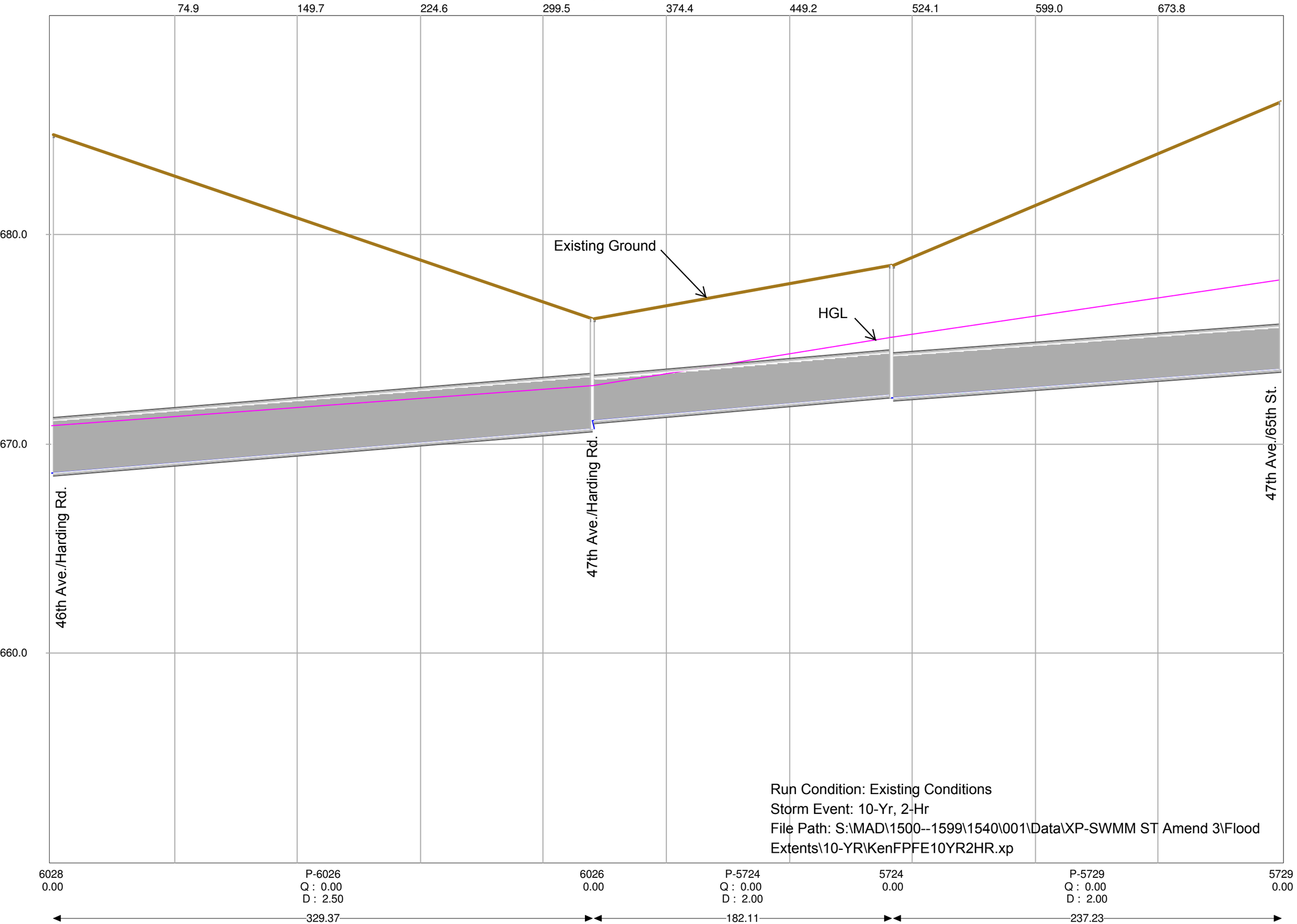
Untitled
Day [0] Time 00:01:00 Step 1

FPS P5



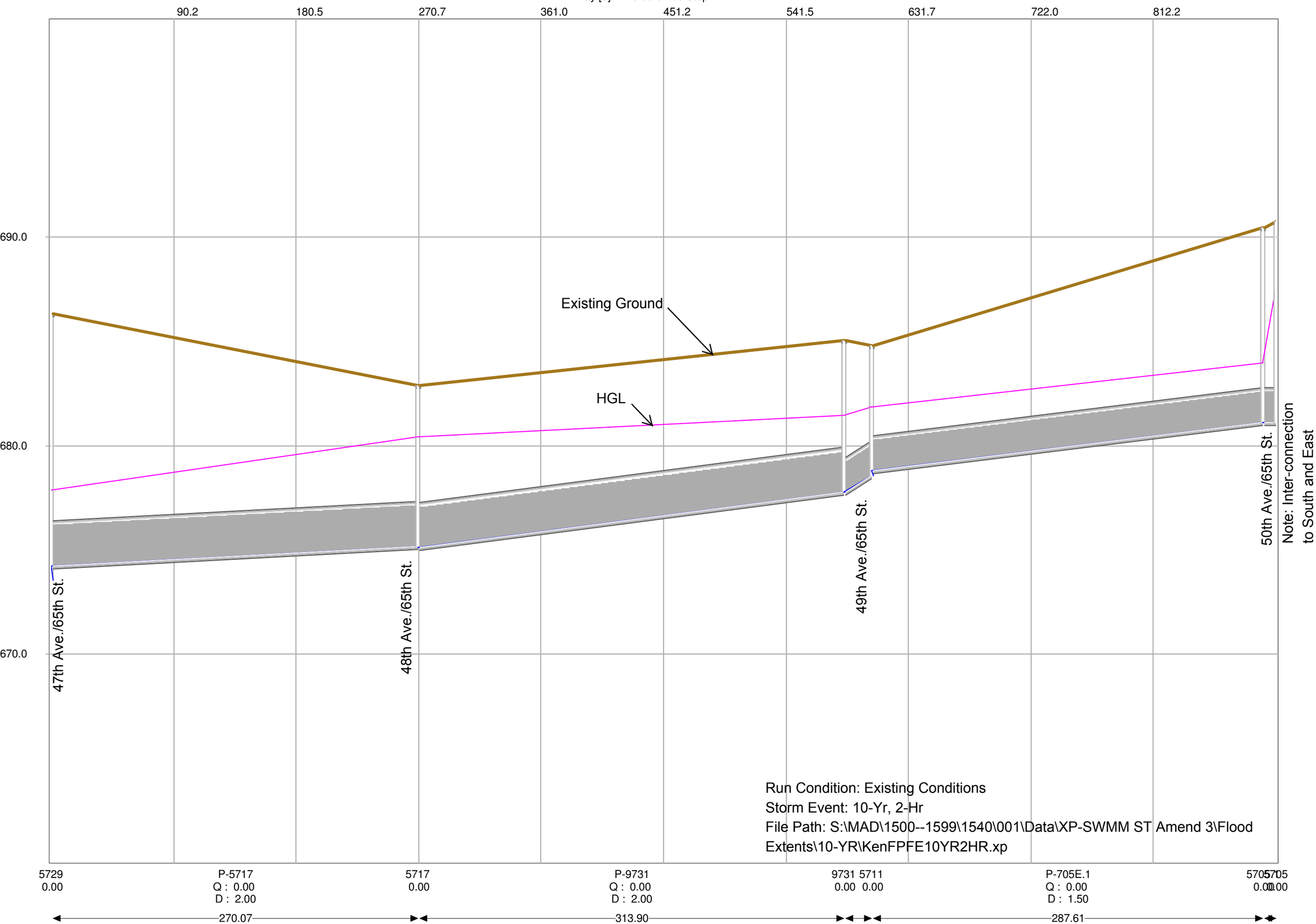
Untitled
Day [0] Time 00:01:00 Step 1

FPS P6



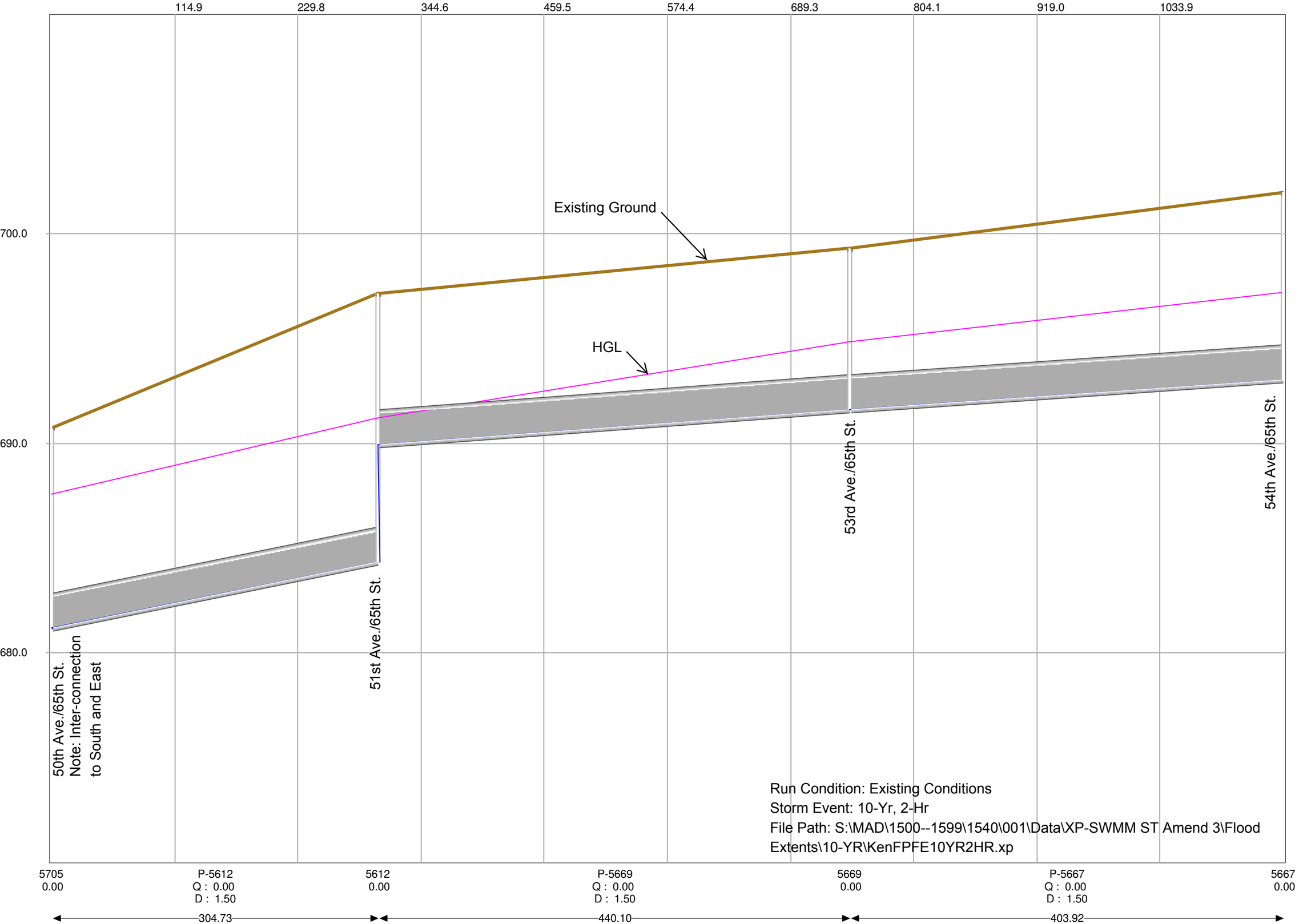
Untitled
Day [0] Time 00:01:00 Step 1

FPS P7



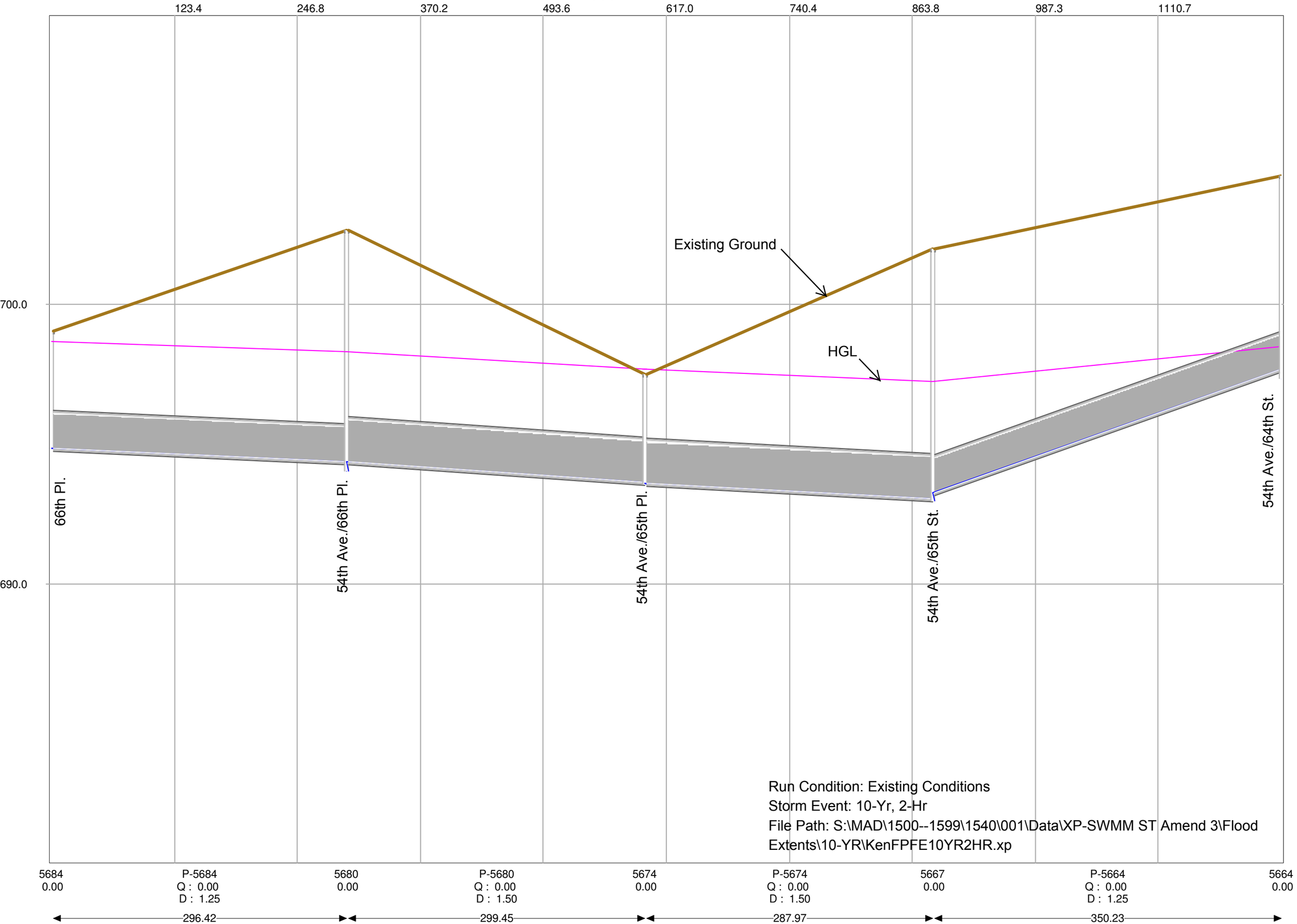
Untitled
Day [0] Time 00:01:00 Step 1

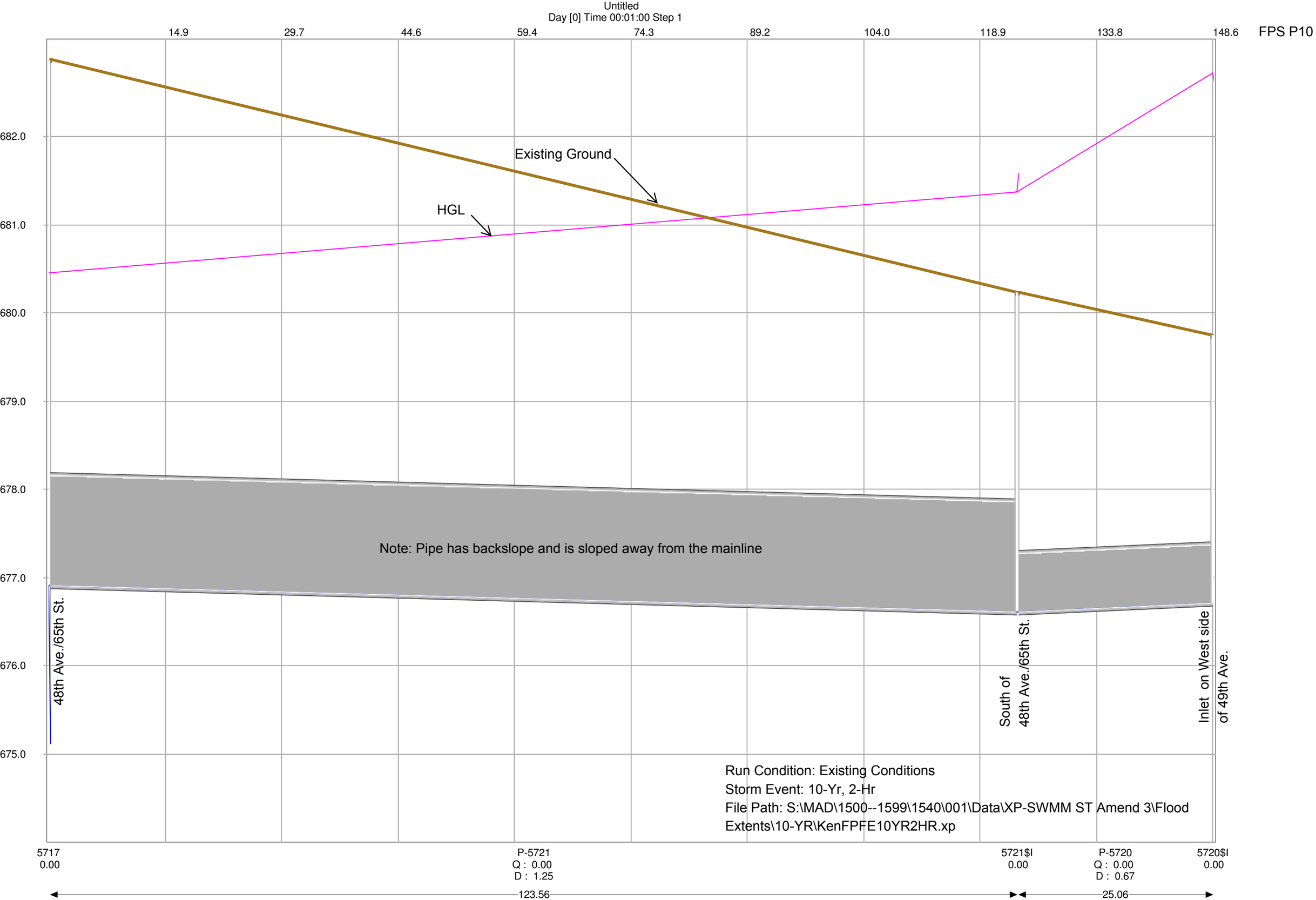
FPS P8



Untitled
Day [0] Time 00:01:00 Step 1

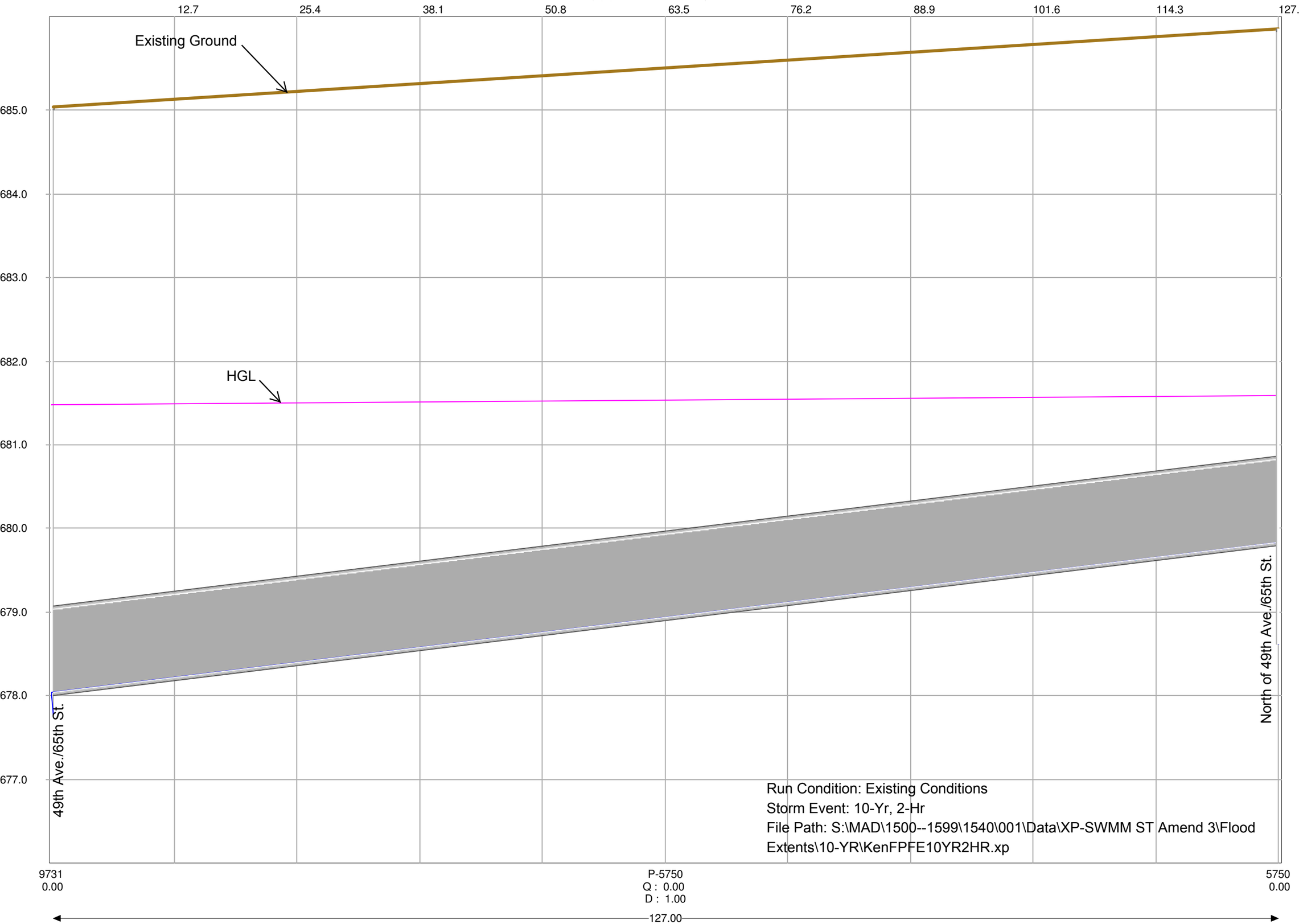
FPS P9




Untitled
Day [0] Time 00:01:00 Step 1
FPS P10
14.9
29.7
44.6
59.4
74.3
89.2
104.0
118.9
133.8
148.6
682.0
681.0
680.0
679.0
678.0
677.0
676.0
675.0
Existing Ground
HGL
Note: Pipe has backslope and is sloped away from the mainline
48th Ave./65th St.
South of
48th Ave./65th St.
Inlet on West side
of 49th Ave.
Run Condition: Existing Conditions
Storm Event: 10-Yr, 2-Hr
File Path: S:\MAD\1500--1599\1540\001\Data\XP-SWMM ST Amend 3\Flood
Extents\10-YR\KenFPFE10YR2HR.xp
5717
0.00
P-5721
Q : 0.00
D : 1.25
5721$I
0.00
P-5720
Q : 0.00
D : 0.67
5720$I
0.00
123.56
25.06

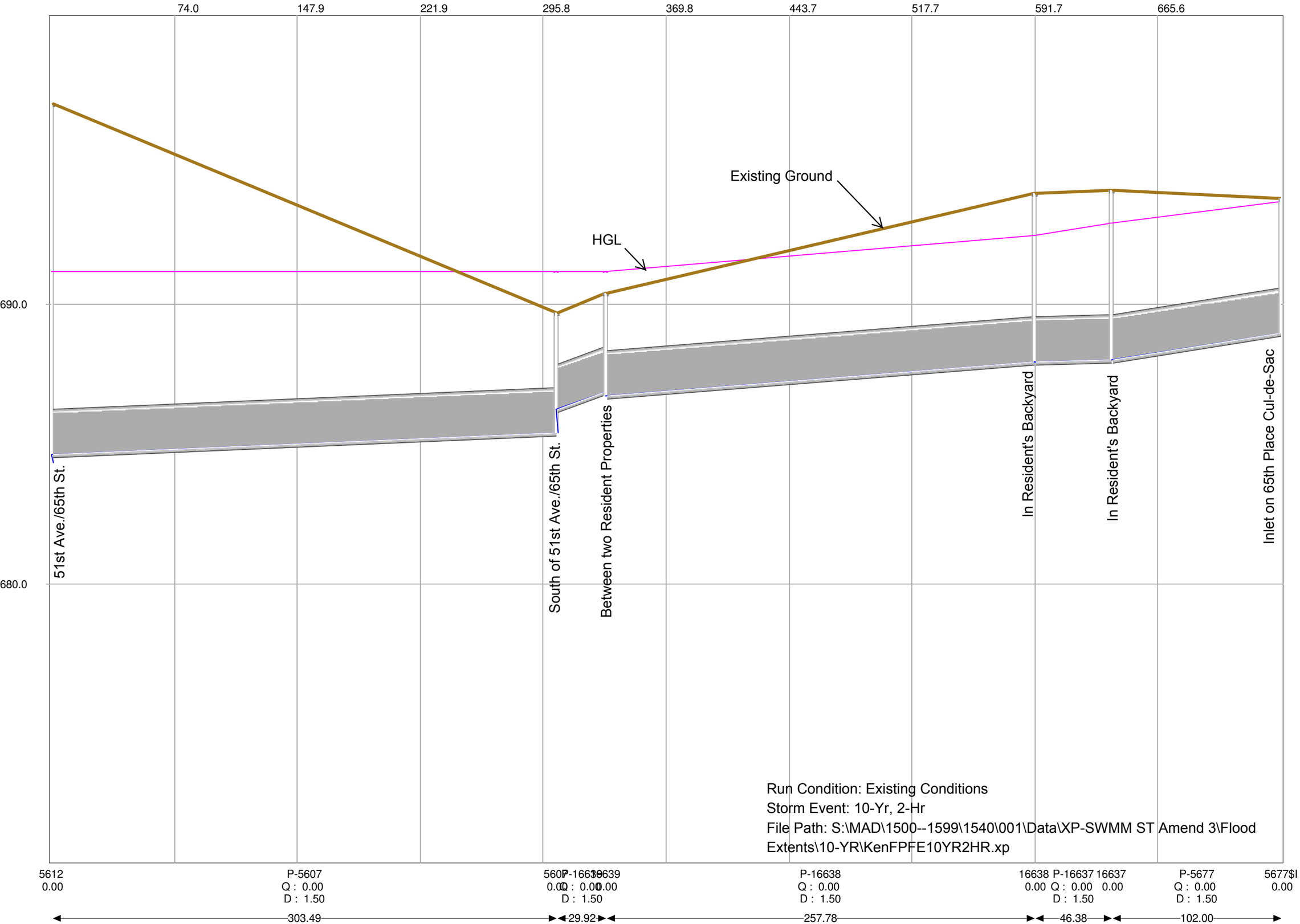
Untitled
Day [0] Time 00:01:00 Step 1

FPS P11



Untitled
Day [0] Time 00:01:00 Step 1

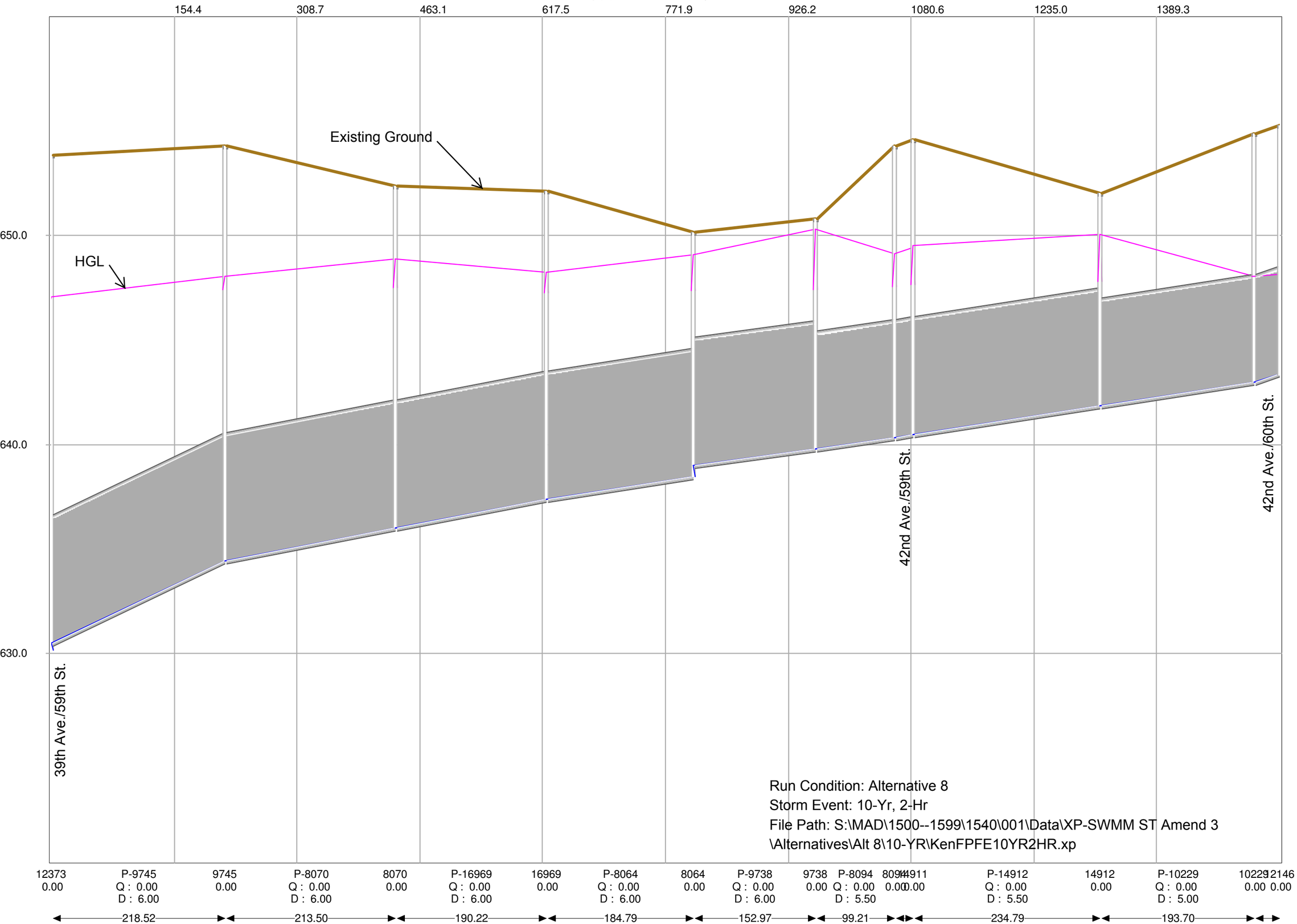
FPS P12



APPENDIX N
ALTERNATIVE 8: 10-YEAR STORM EVENT
MAINLINE PROFILES (FOREST PARK NORTH)

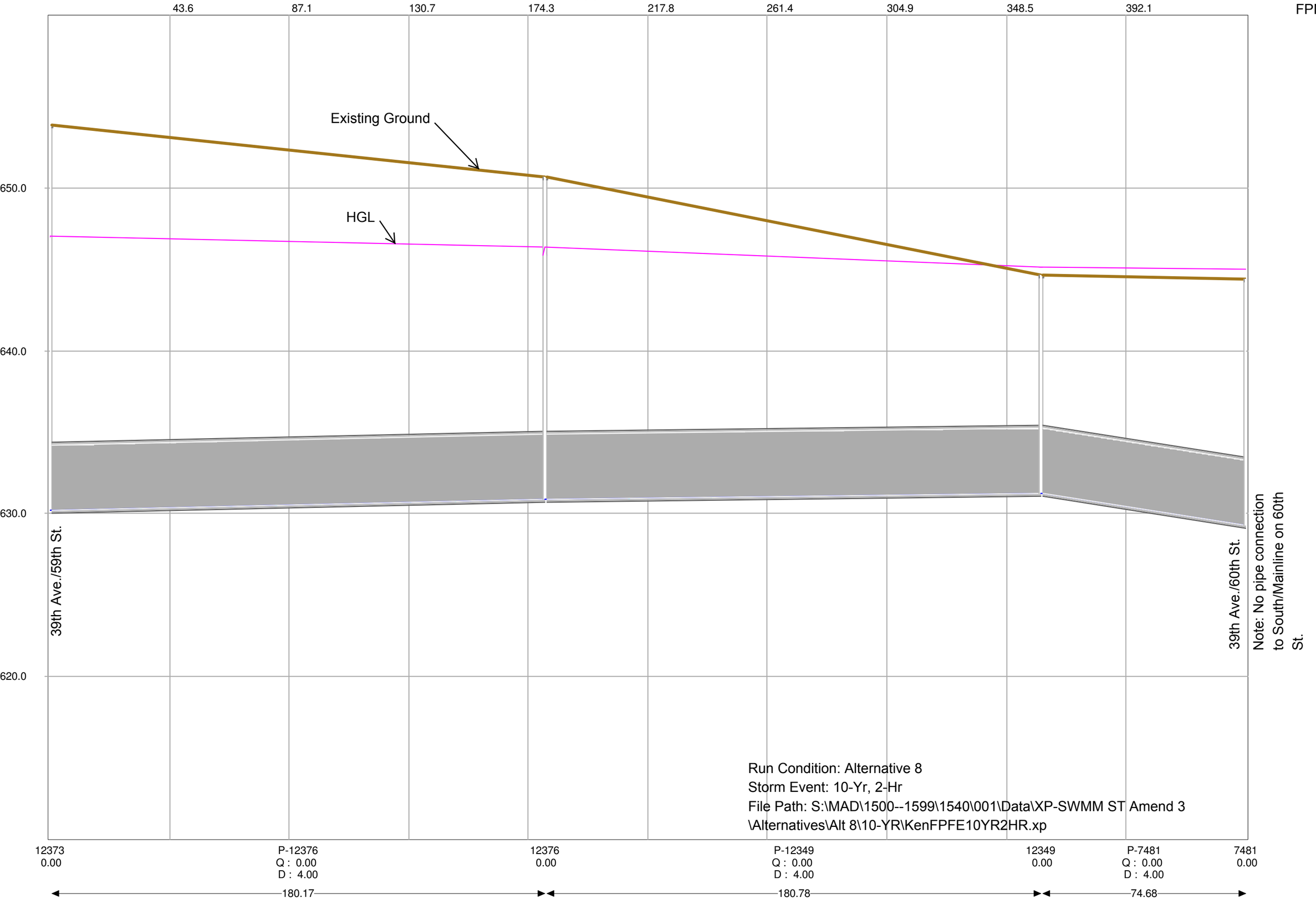
Untitled
Day [0] Time 00:01:00 Step 1

FPN P1



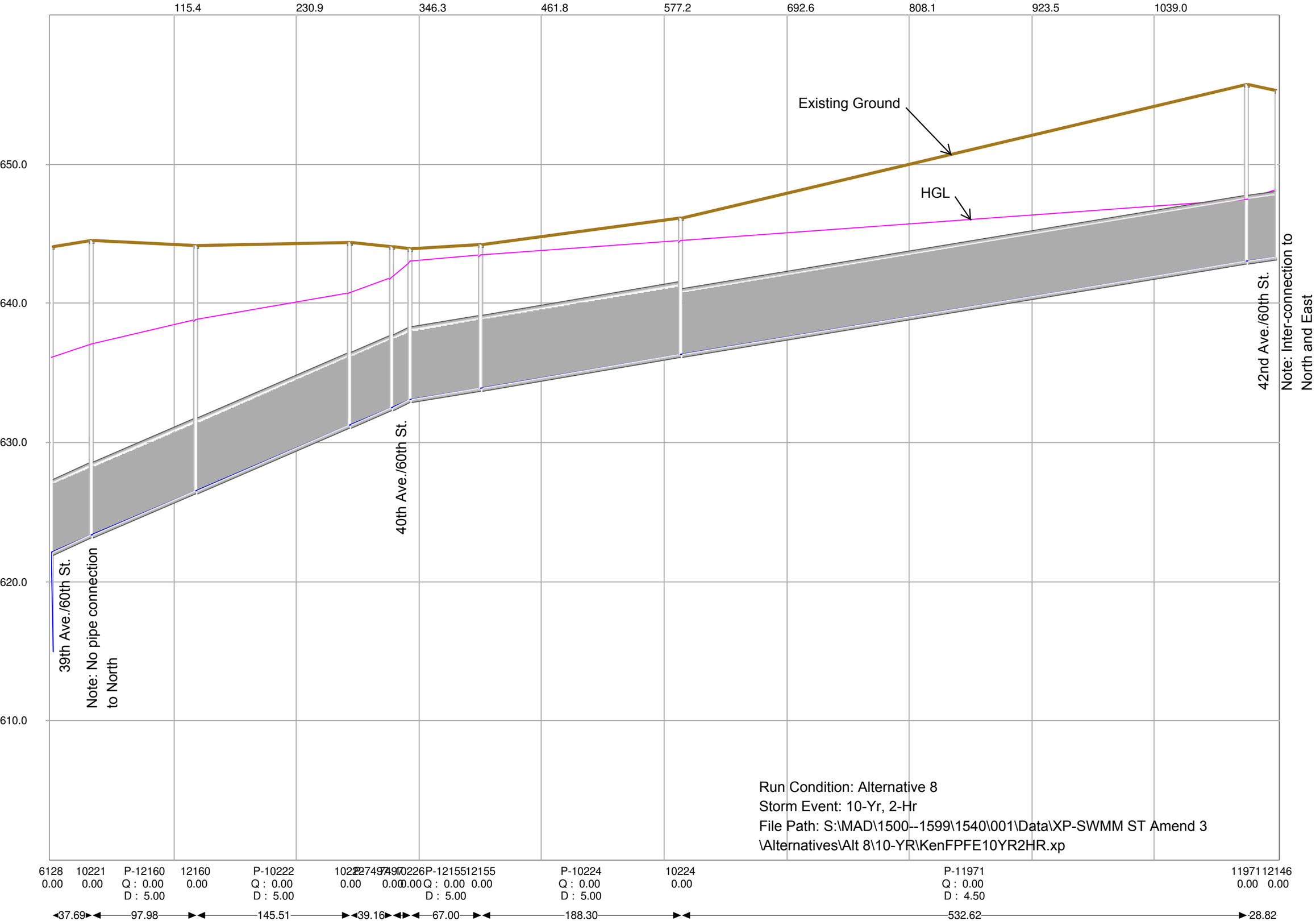
Untitled
Day [0] Time 00:01:00 Step 1

FPN P2



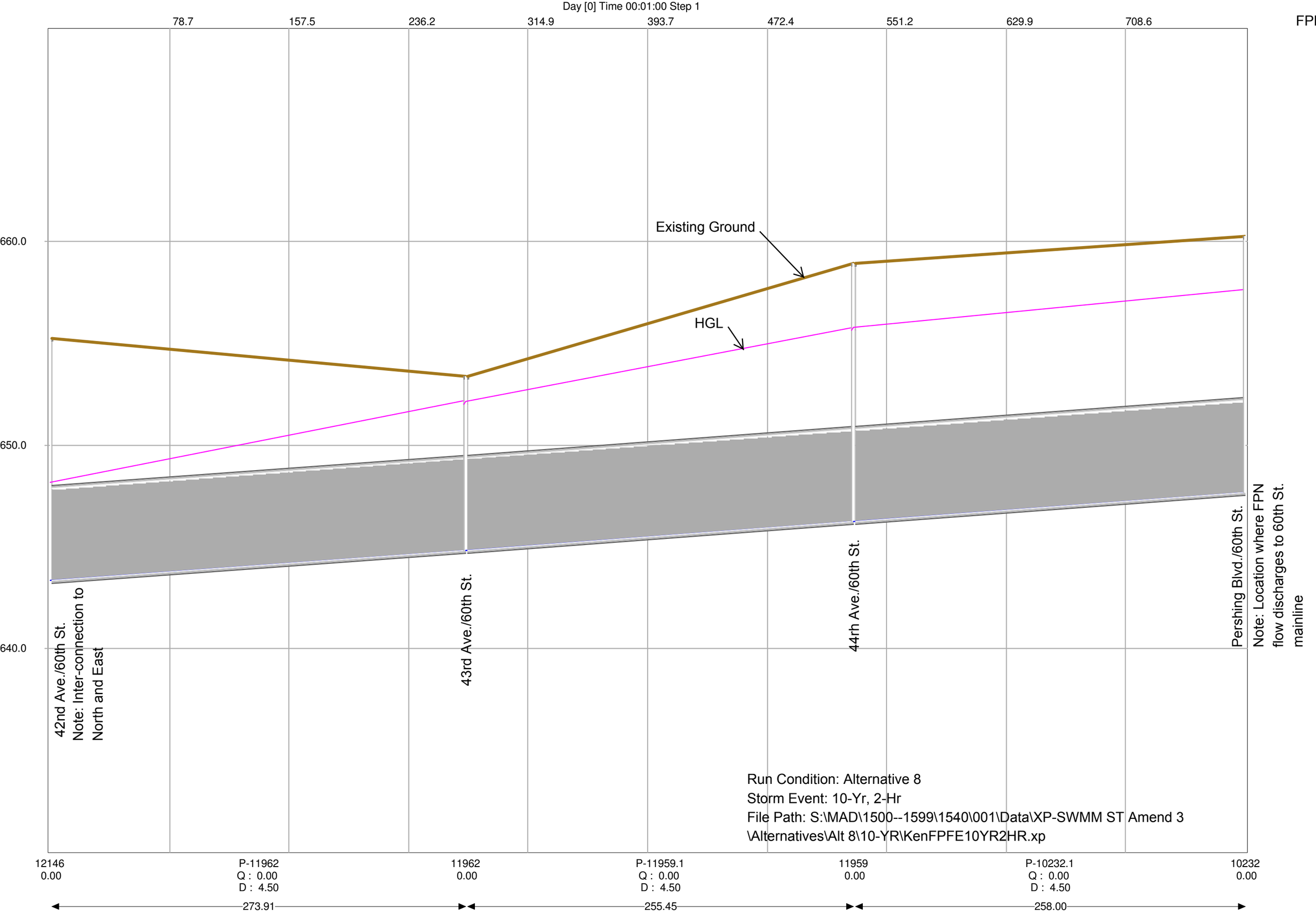
Untitled
Day [0] Time 00:01:00 Step 1

FPN P3



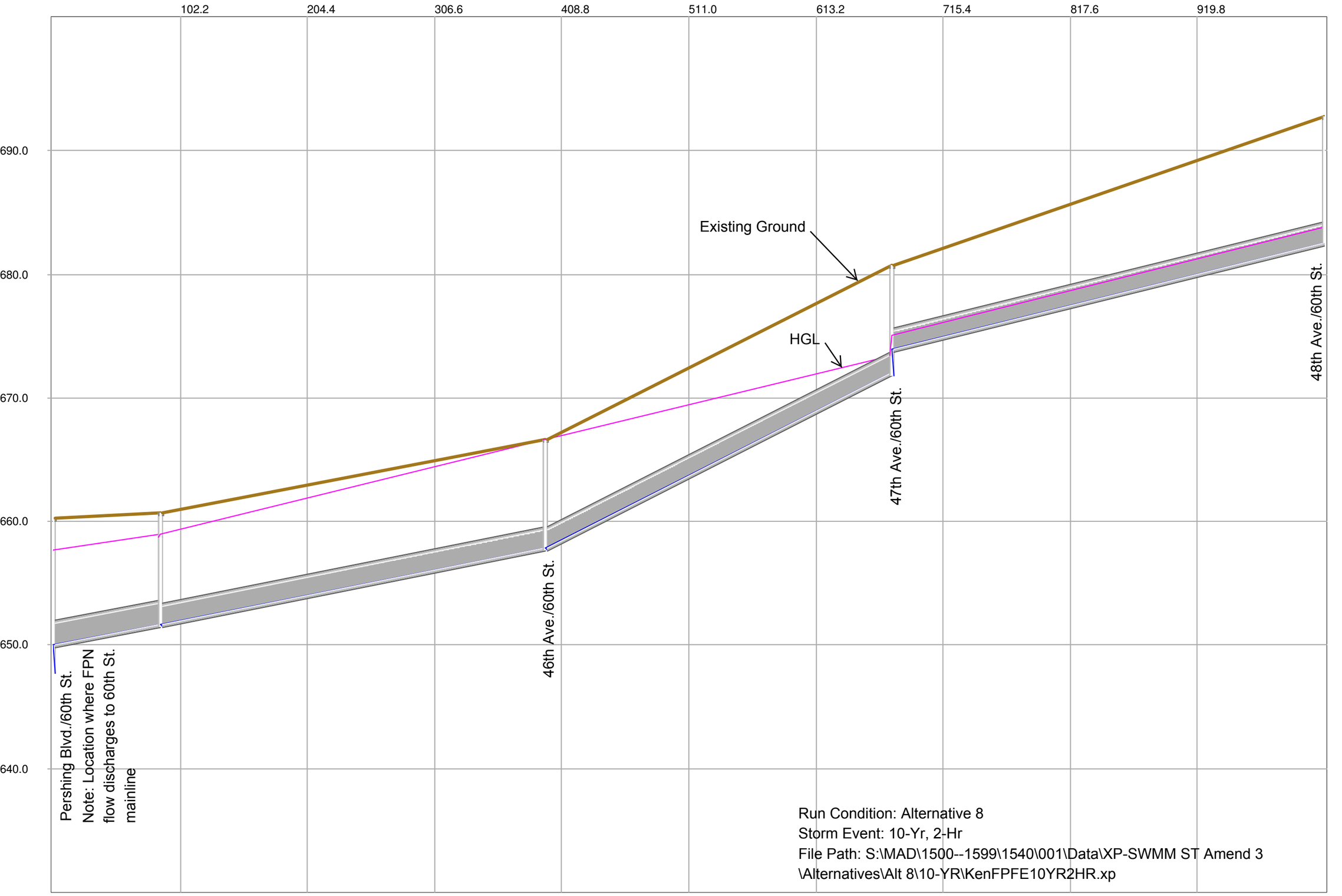
Untitled
Day [0] Time 00:01:00 Step 1

FPN P4



Untitled
Day [0] Time 00:01:00 Step 1

FPN P5

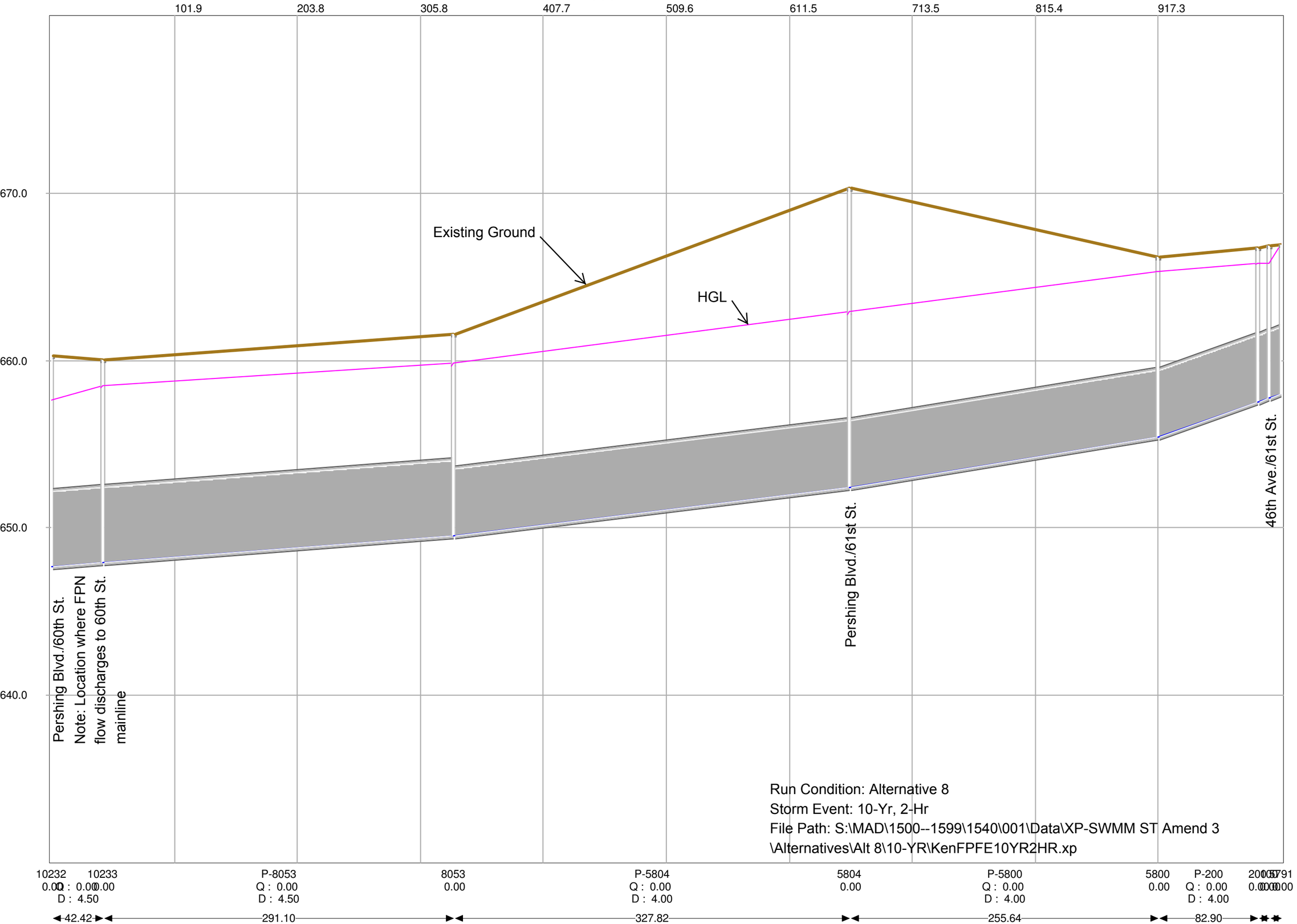


10232	P-10231.1	10231	P-11763.1	11763	P-11748	11748	P-16964	16964
0.00	Q : 0.00 D : 1.75	0.00	Q : 0.00 D : 1.50	0.00	Q : 0.00 D : 1.50	0.00	Q : 0.00 D : 1.50	0.00

86.35 | 309.15 | 279.12 | 347.40

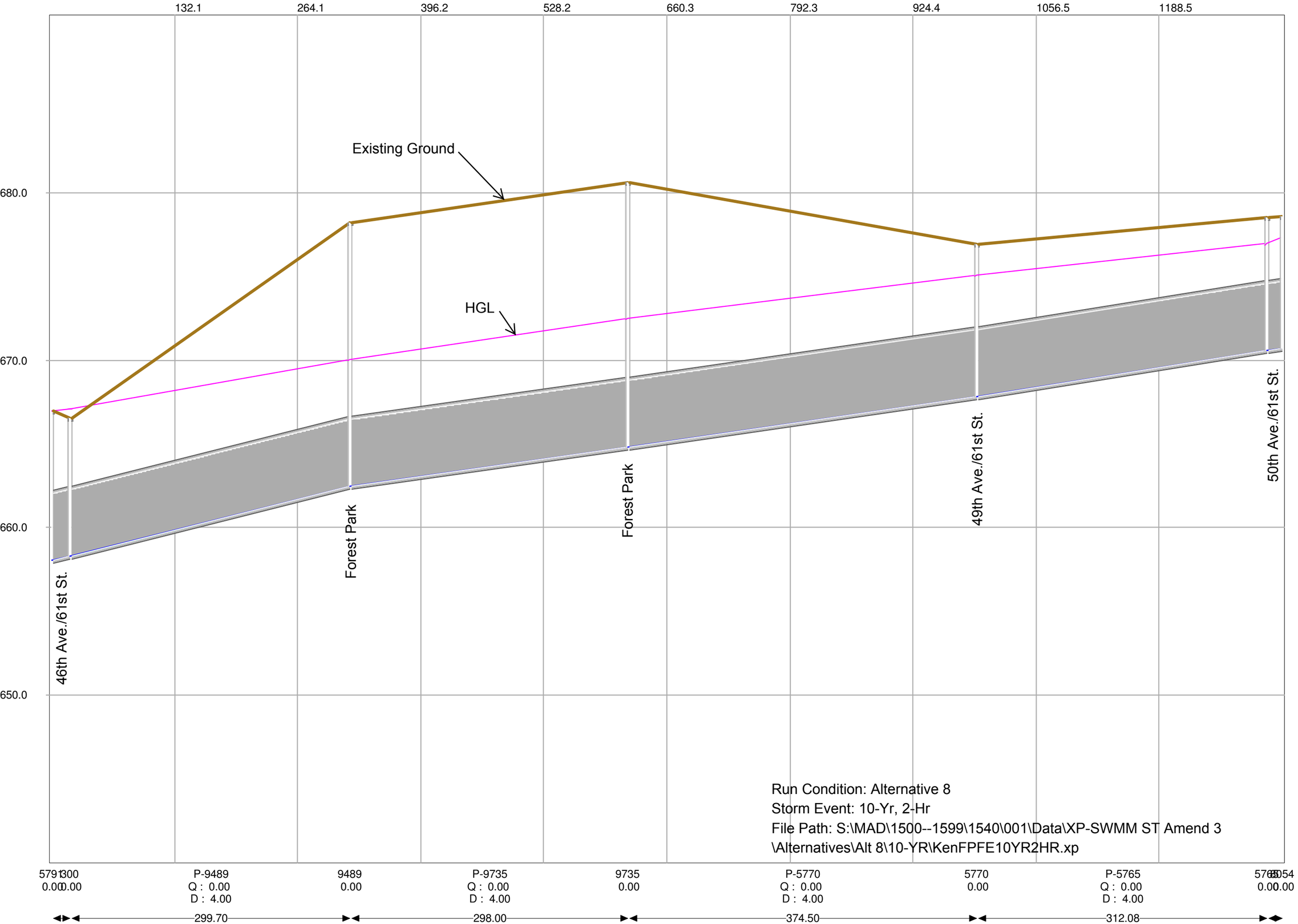
Untitled
Day [0] Time 00:01:00 Step 1

FPN P6



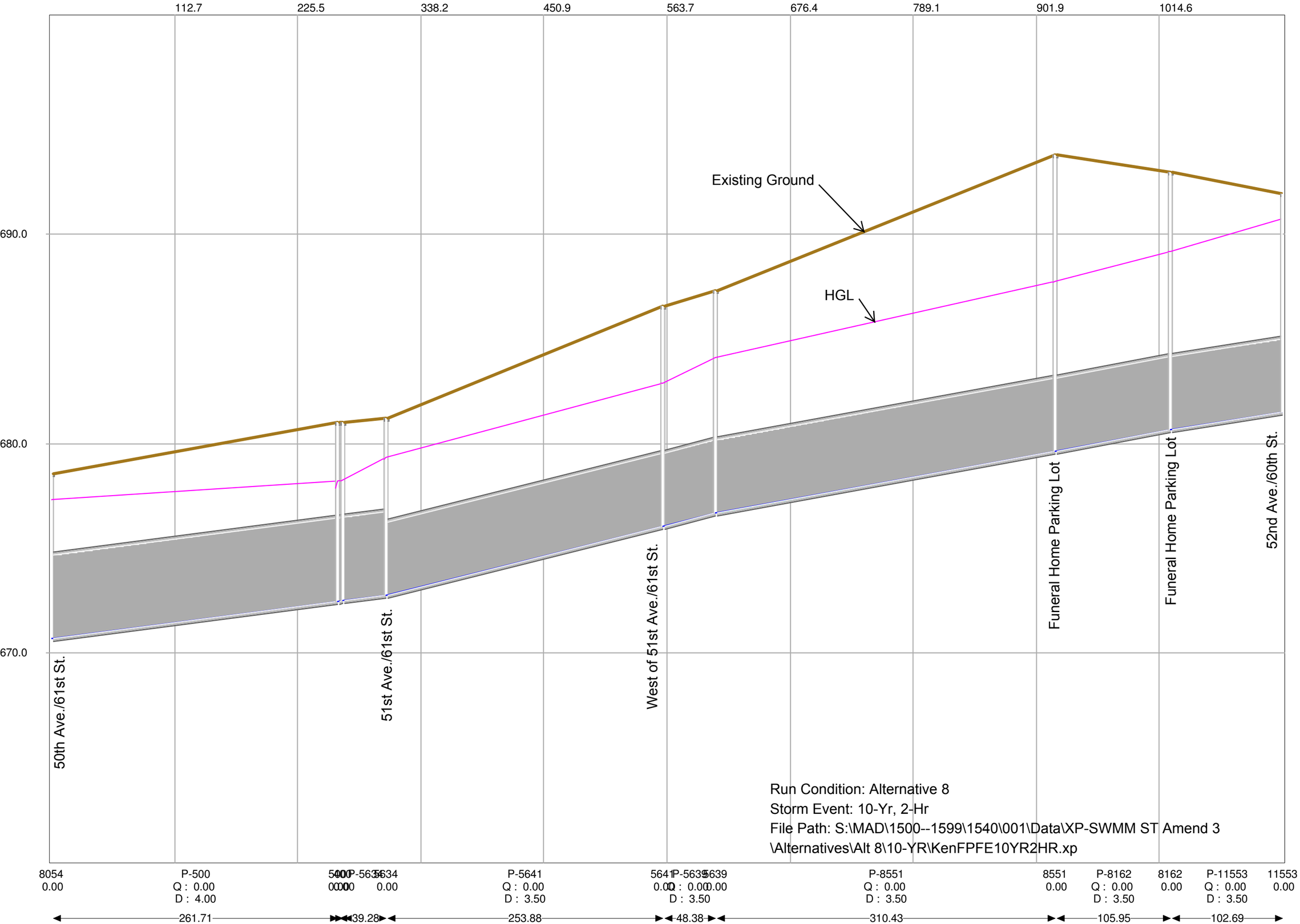
Untitled
Day [0] Time 00:01:00 Step 1

FPN P7



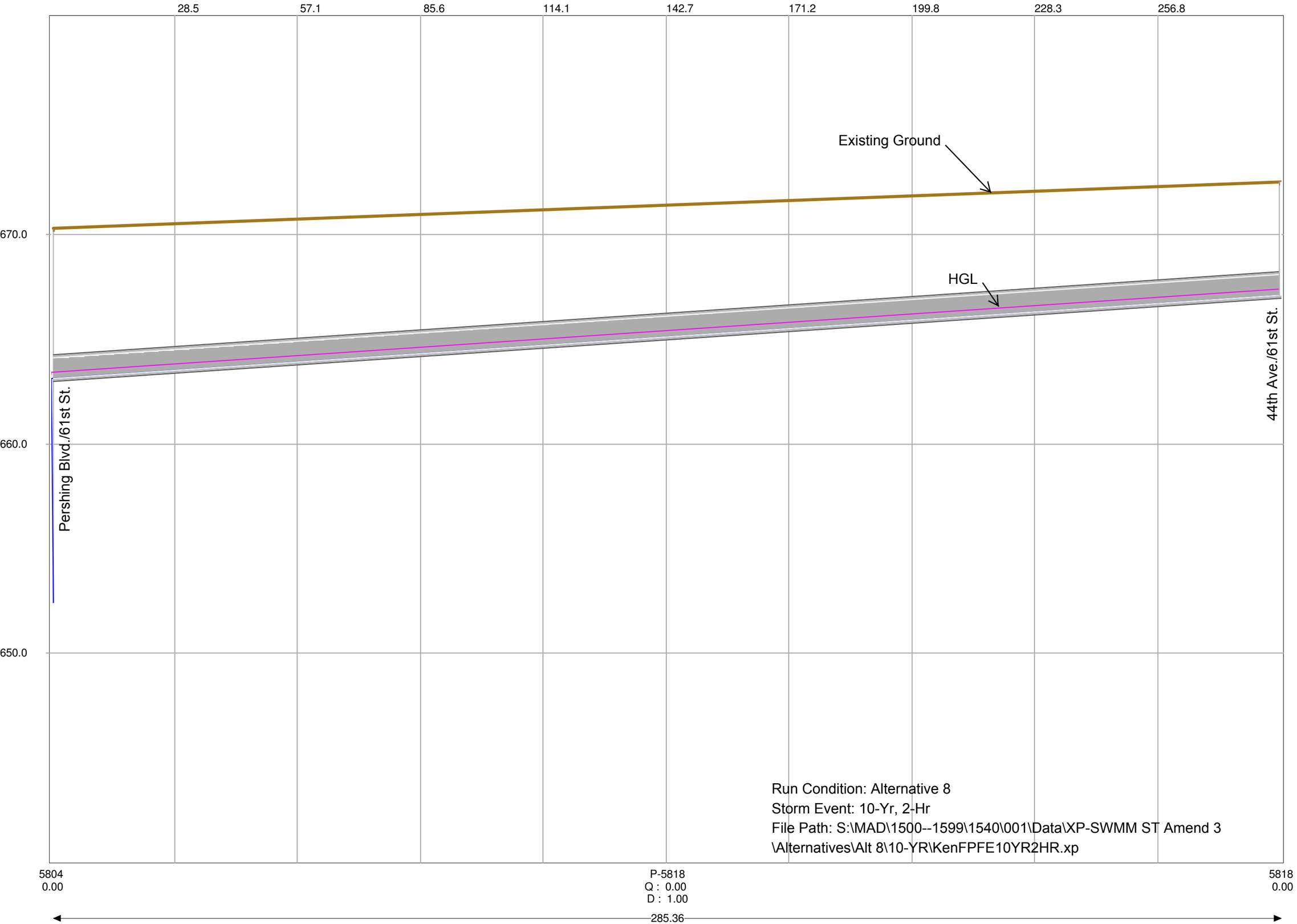
Untitled
Day [0] Time 00:01:00 Step 1

FPN P8



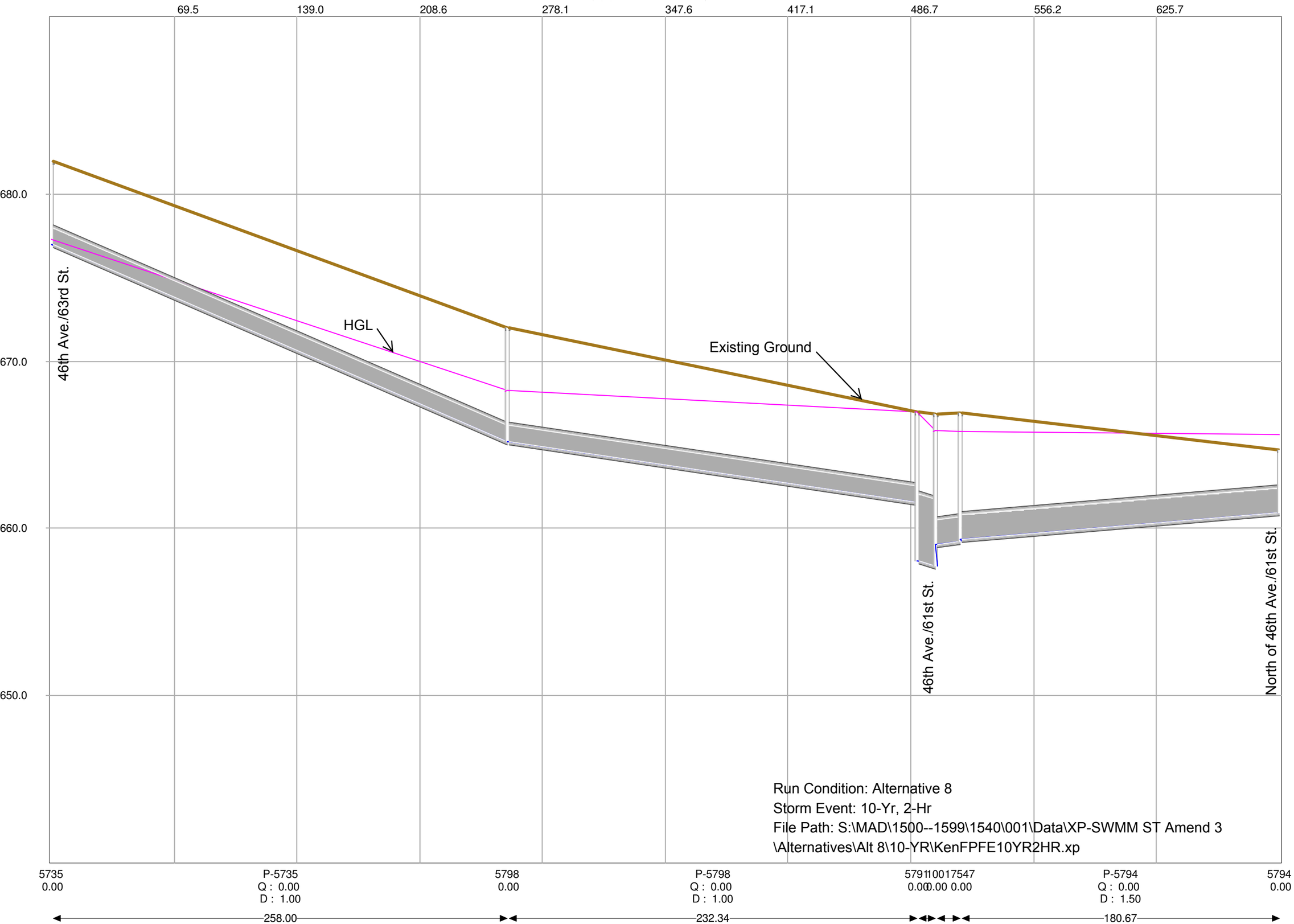
Untitled
Day [0] Time 00:01:00 Step 1

FPN P9



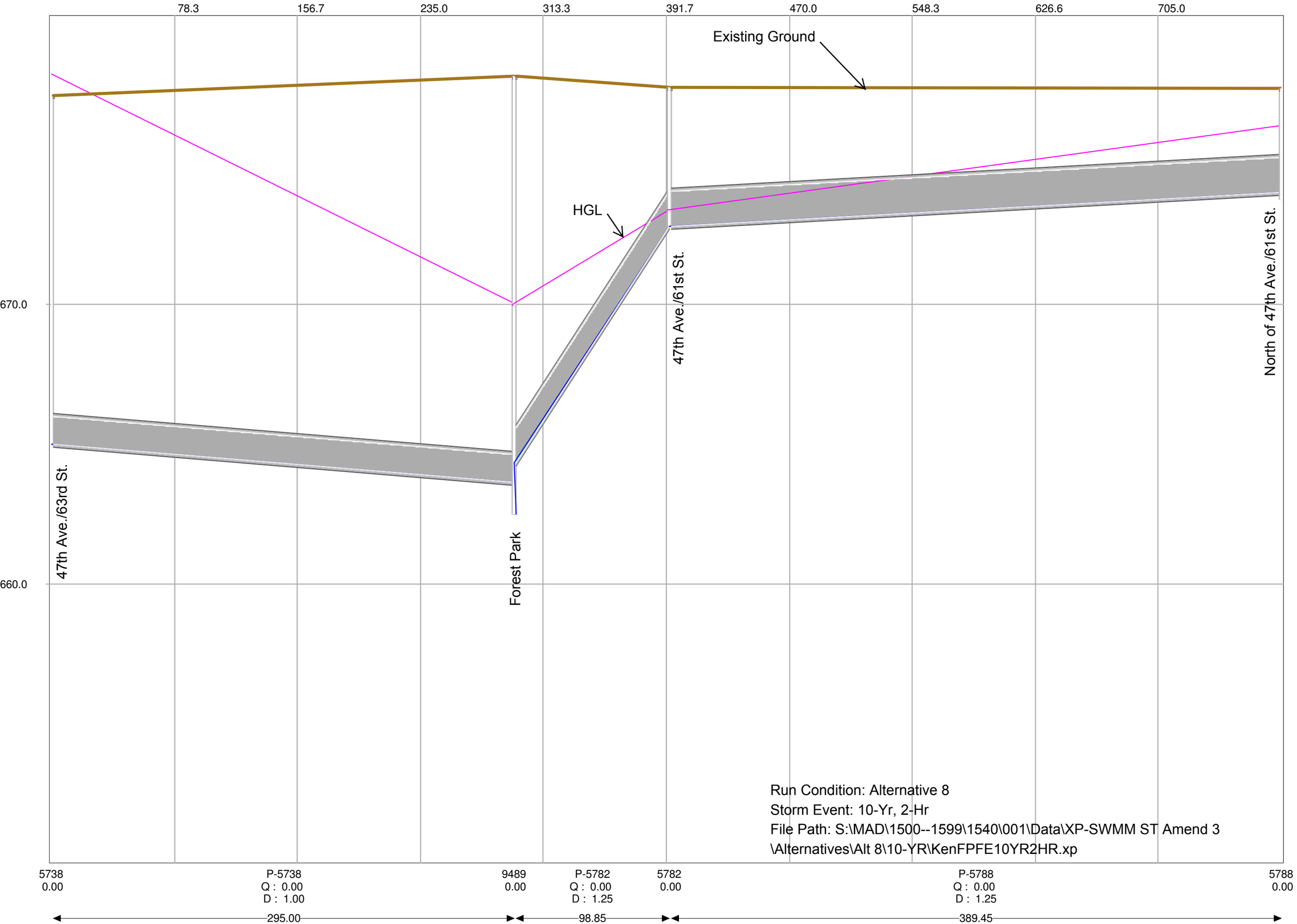
Untitled
Day [0] Time 00:01:00 Step 1

FPN P10



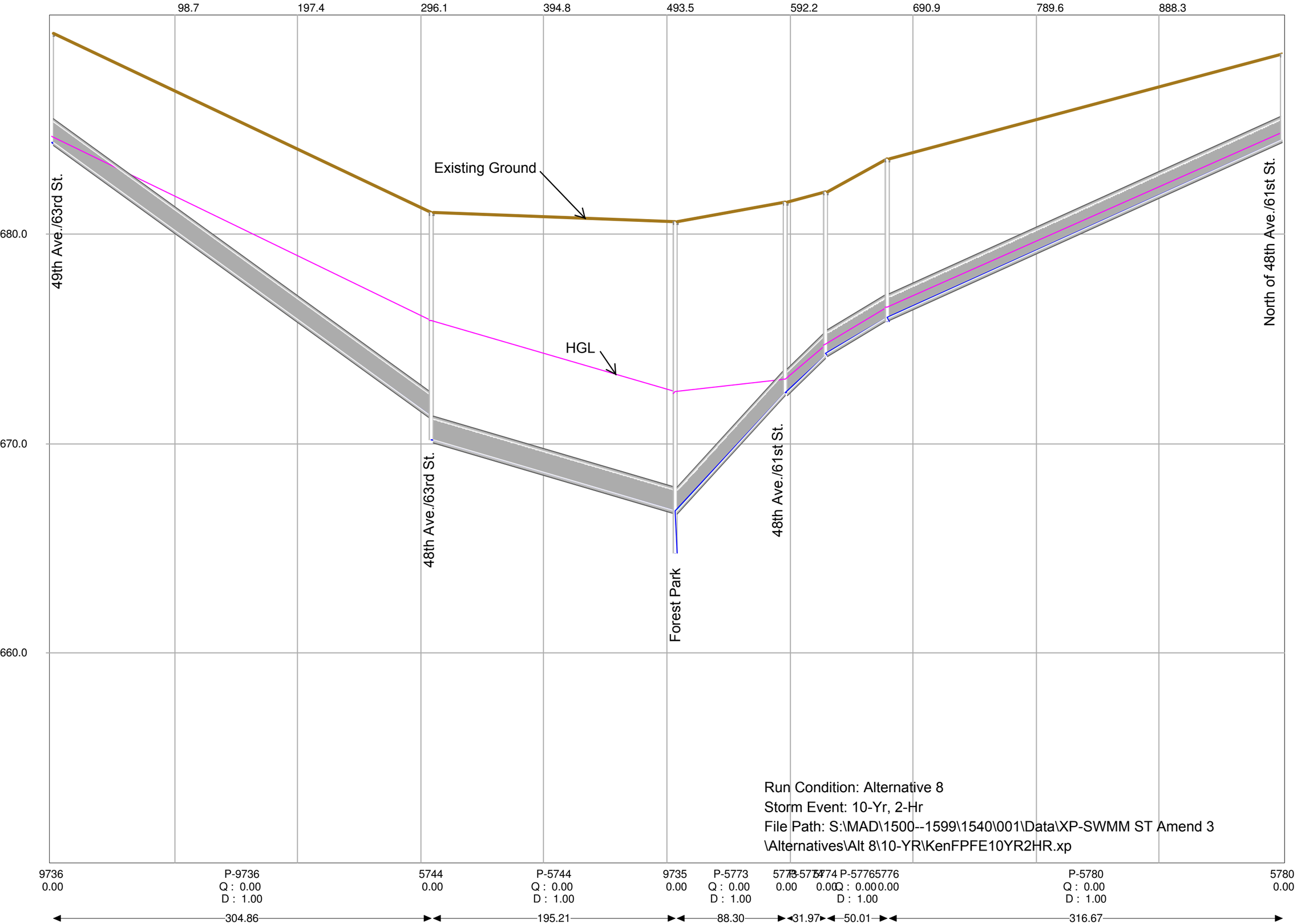
Untitled
Day [0] Time 00:01:00 Step 1

FPN P11



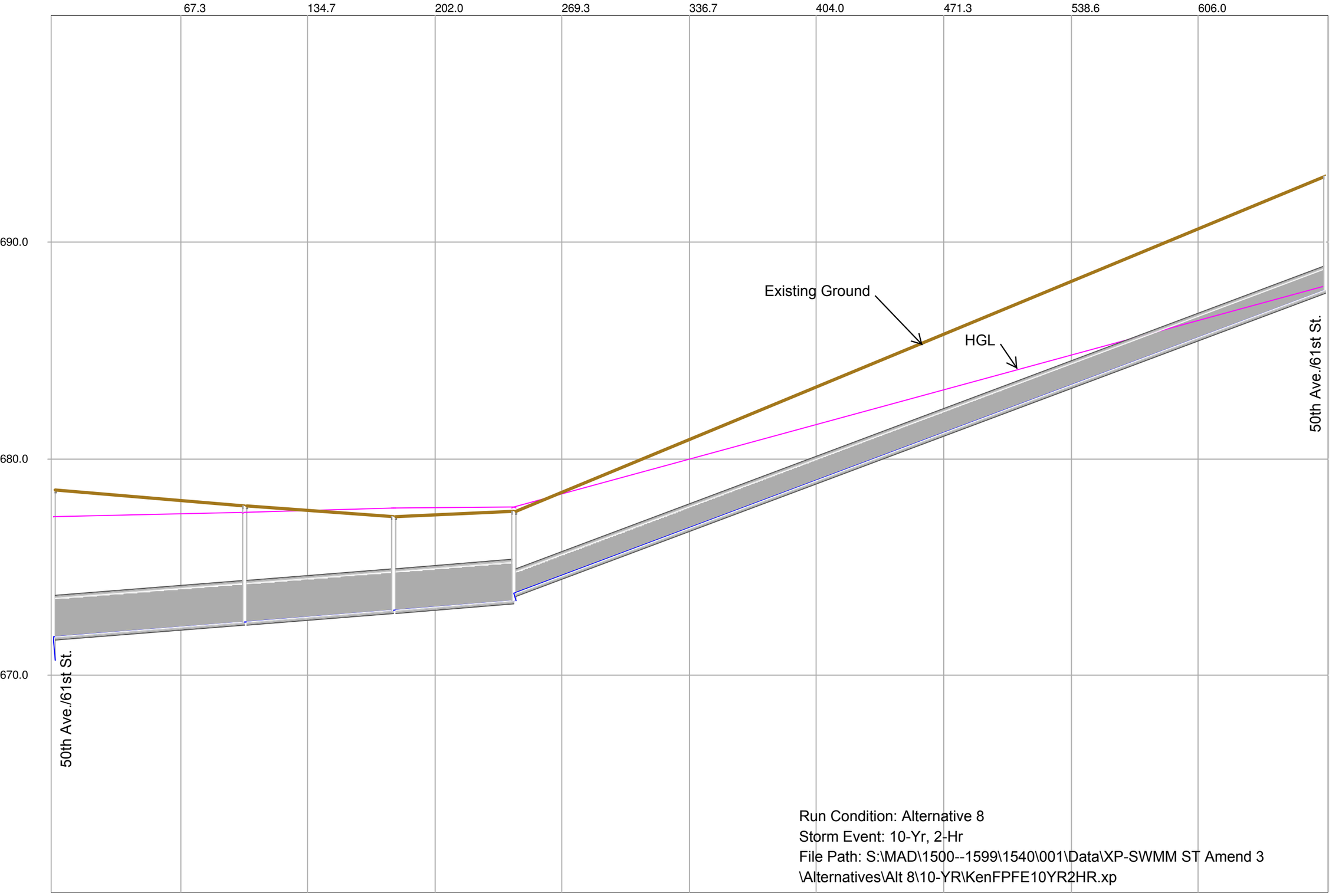
Untitled
Day [0] Time 00:01:00 Step 1

FPN P12



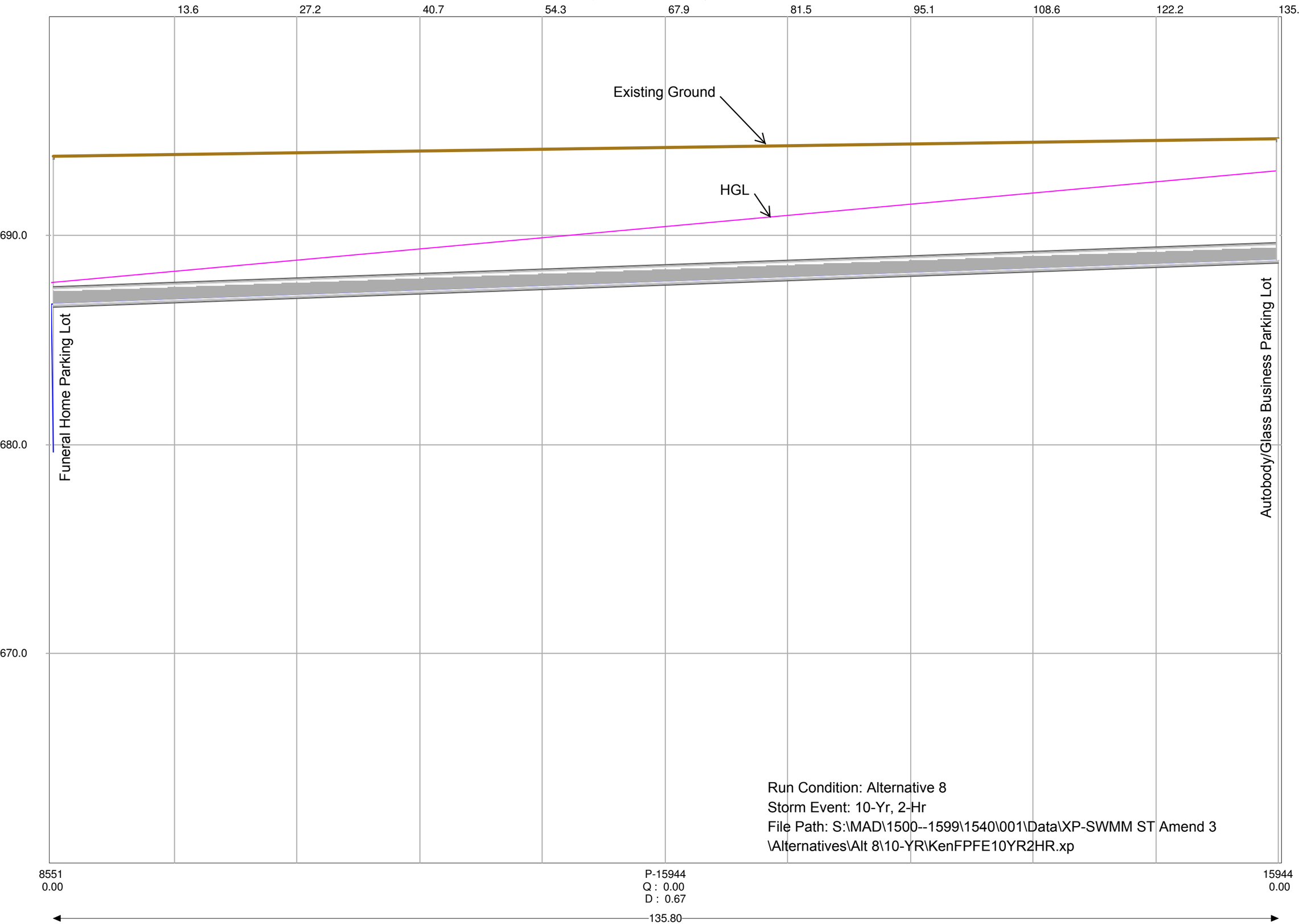
Untitled
Day [0] Time 00:01:00 Step 1

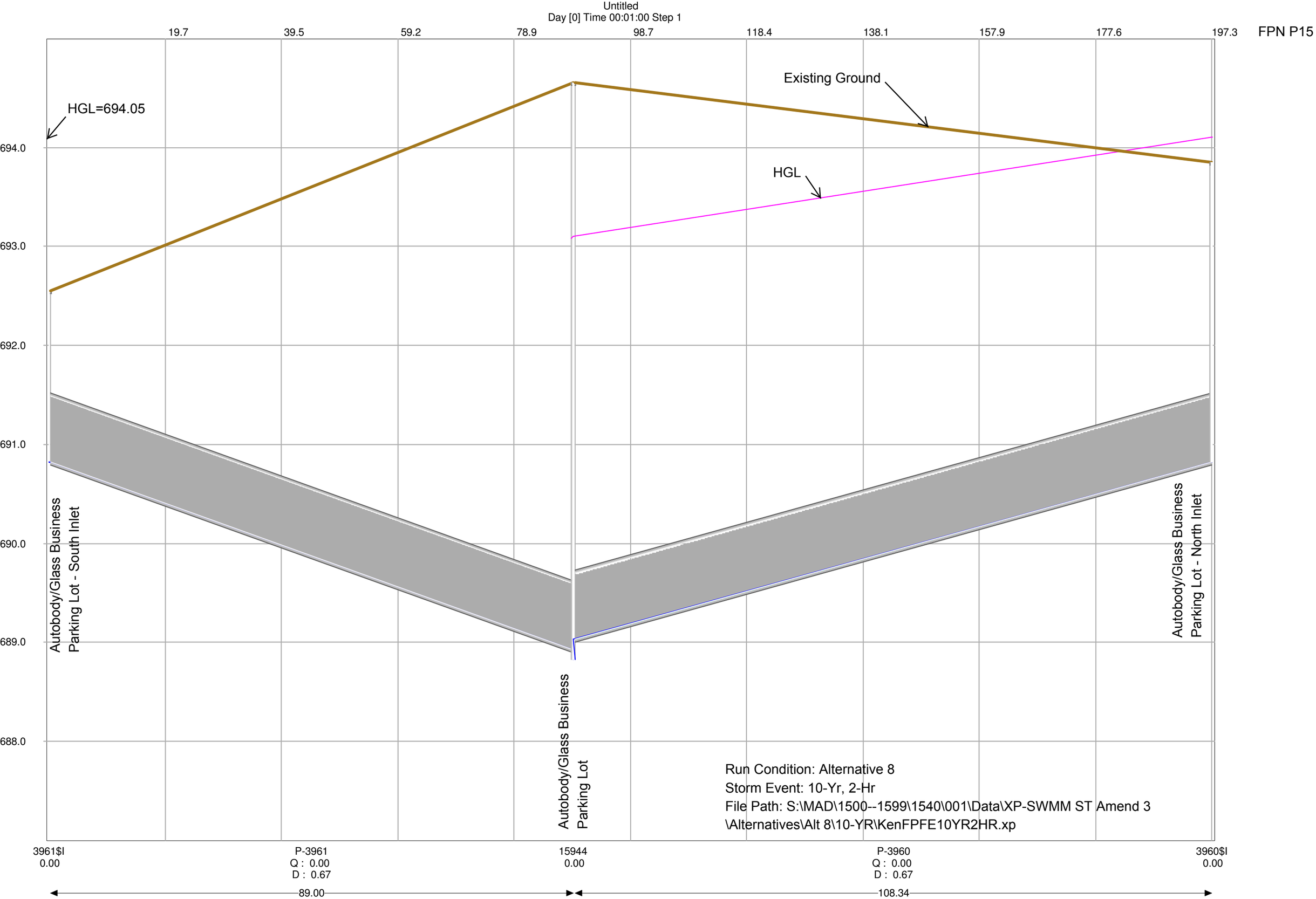
FPN P13



Untitled
Day [0] Time 00:01:00 Step 1

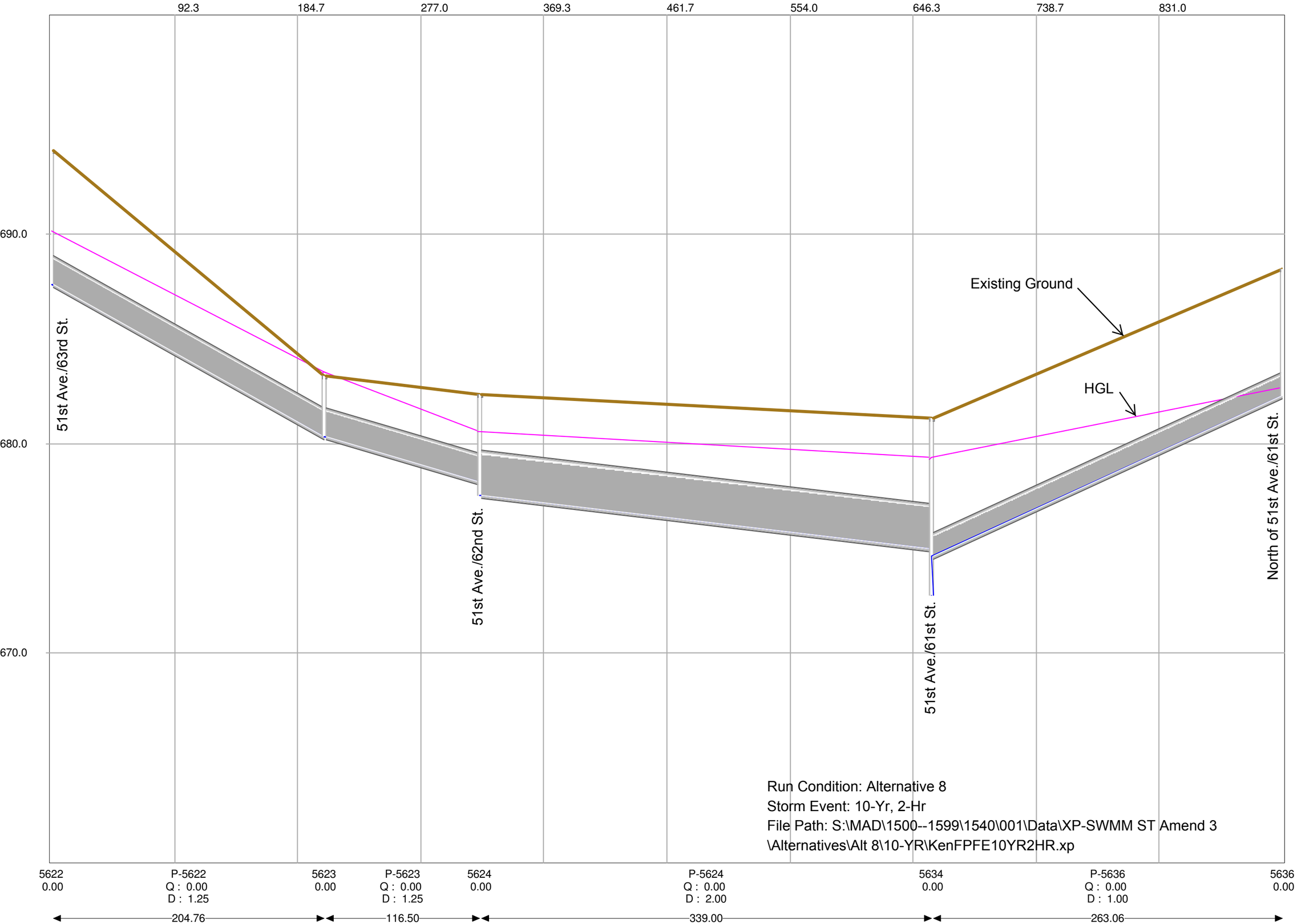
FPN P14




Untitled
Day [0] Time 00:01:00 Step 1
FPN P15
19.7
39.5
59.2
78.9
98.7
118.4
138.1
157.9
177.6
197.3
694.0
693.0
692.0
691.0
690.0
689.0
688.0
HGL=694.05
Existing Ground
HGL
Autobody/Glass Business Parking Lot - South Inlet
Autobody/Glass Business Parking Lot
Autobody/Glass Business Parking Lot - North Inlet
Run Condition: Alternative 8
Storm Event: 10-Yr, 2-Hr
File Path: S:\MAD\1500--1599\1540\001\Data\XP-SWMM ST Amend 3
\Alternatives\Alt 8\10-YR\KenFPFE10YR2HR.xp
3961$I
0.00
P-3961
Q : 0.00
D : 0.67
15944
0.00
P-3960
Q : 0.00
D : 0.67
3960$I
0.00
89.00
108.34

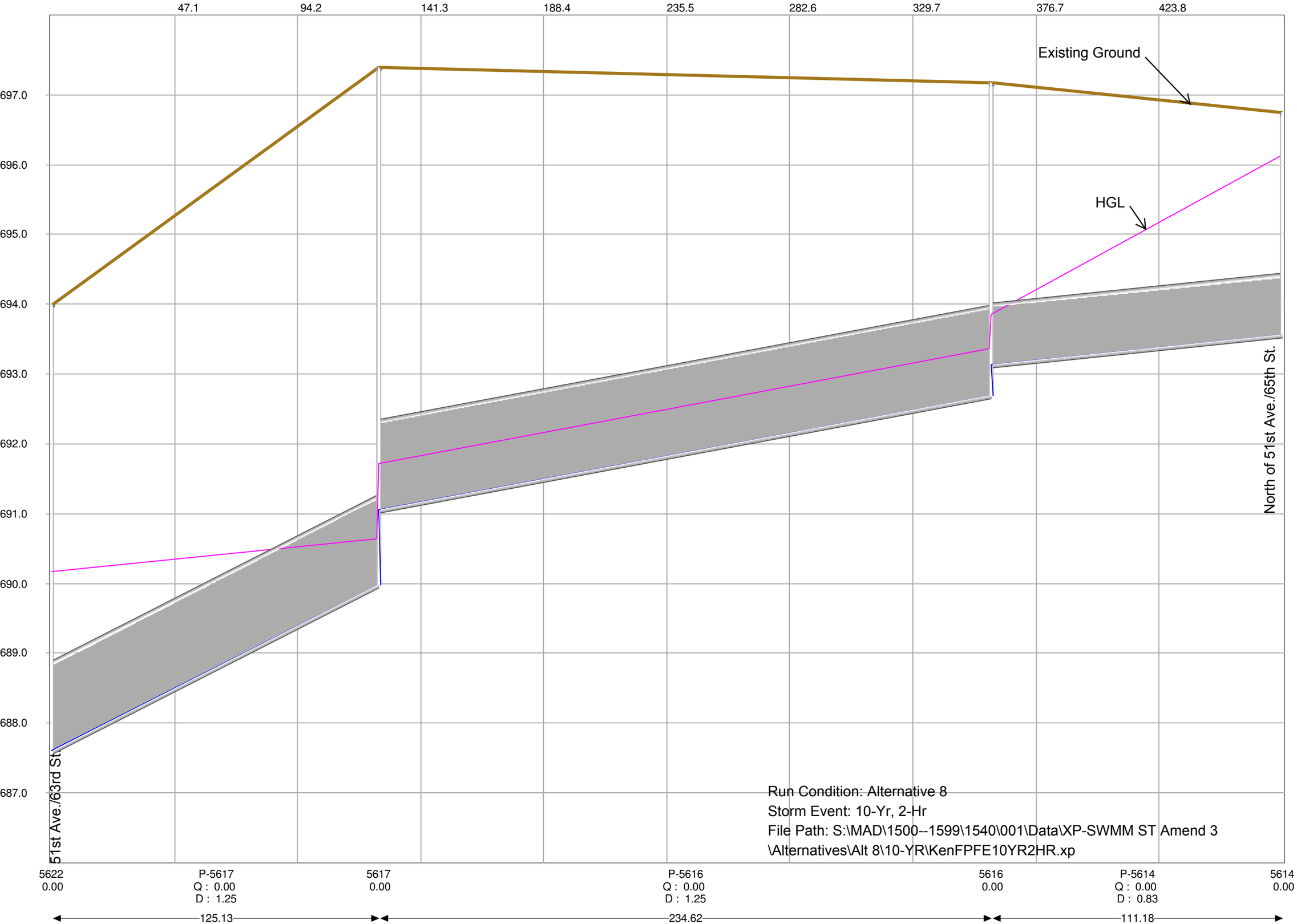
Untitled
Day [0] Time 00:01:00 Step 1

FPN P16



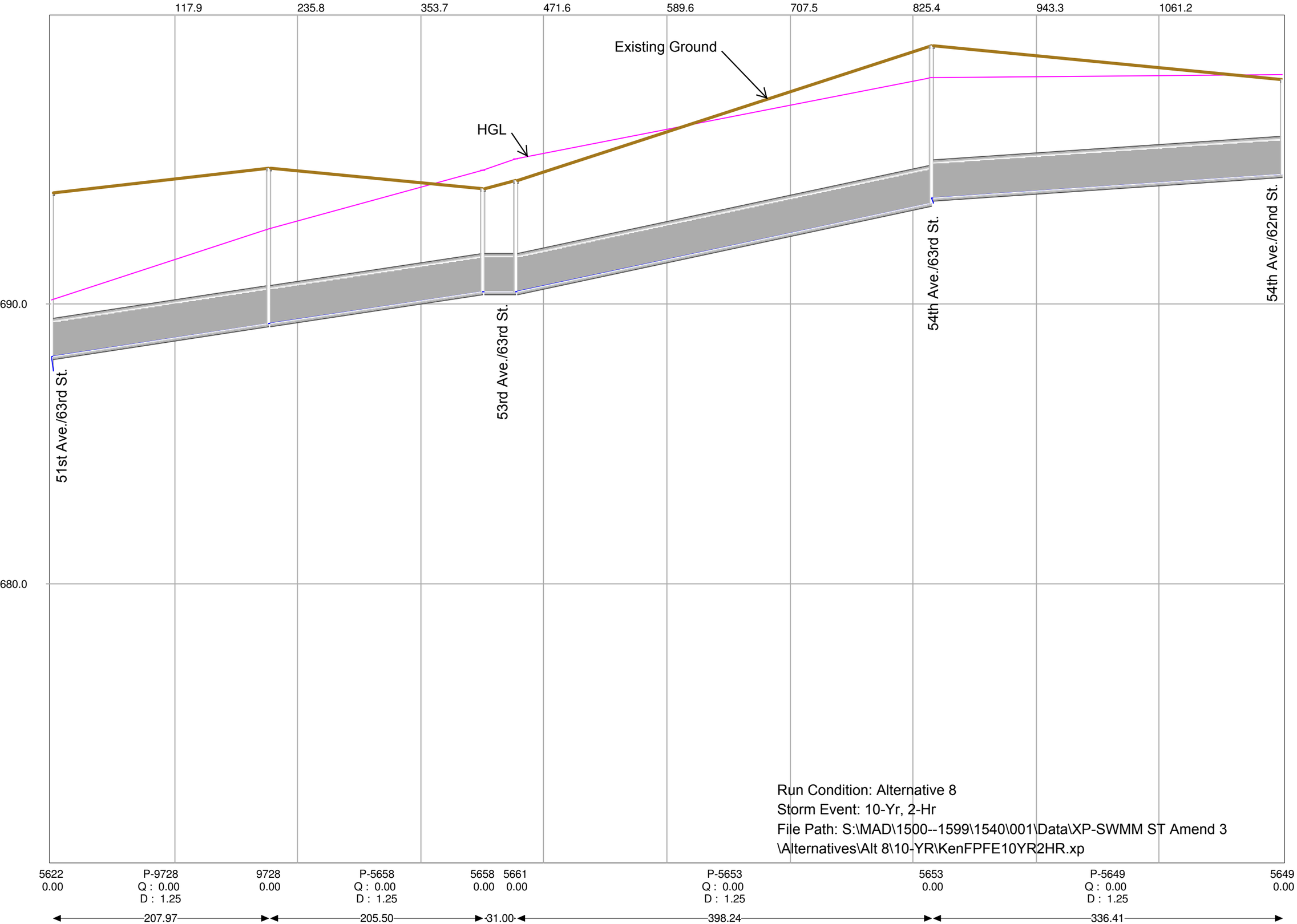
Untitled
Day [0] Time 00:01:00 Step 1

FPN P17



Untitled
Day [0] Time 00:01:00 Step 1

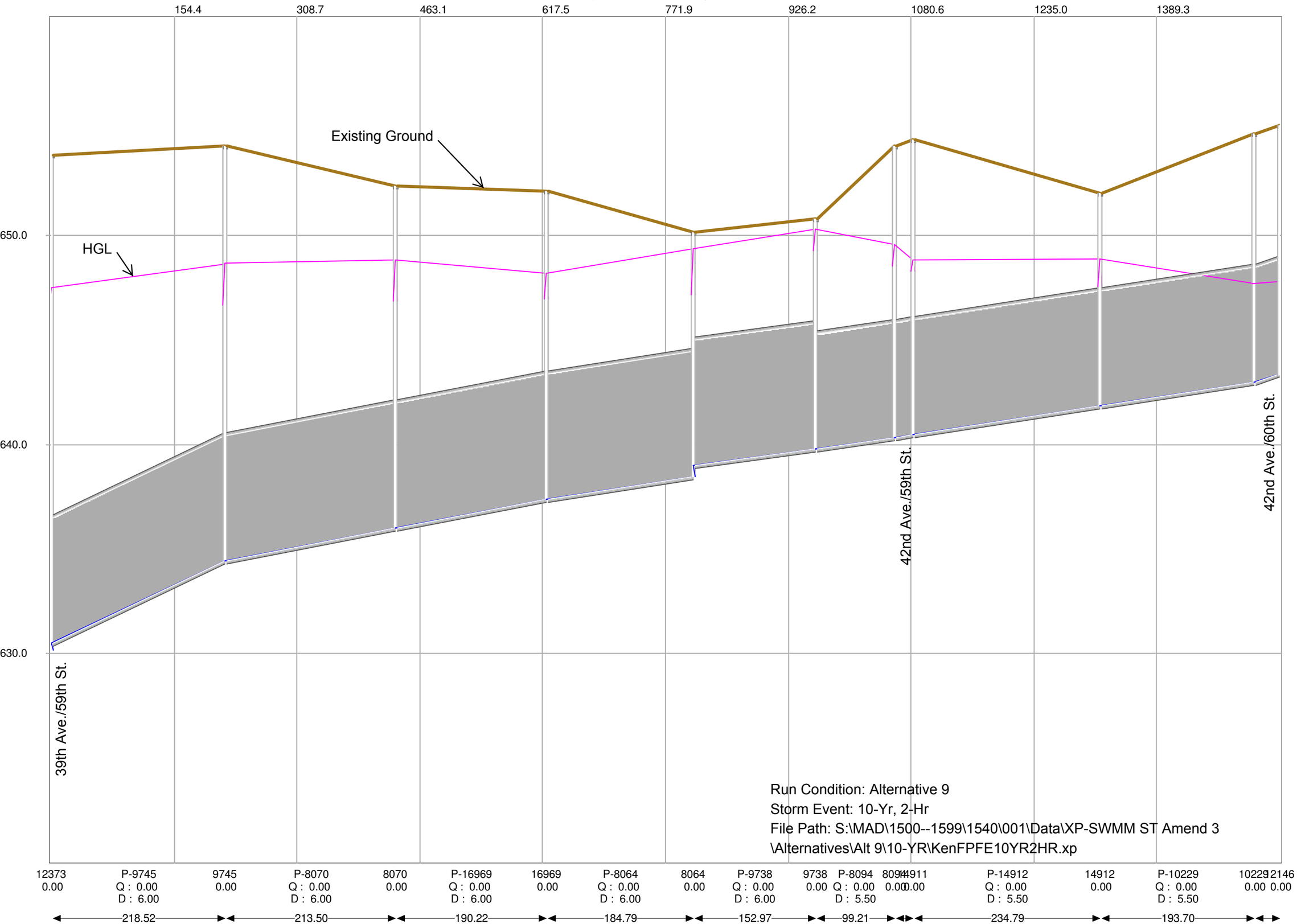
FPN P18



APPENDIX O
ALTERNATIVE 9: 10-YEAR STORM EVENT
MAINLINE PROFILES (FOREST PARK SOUTH)

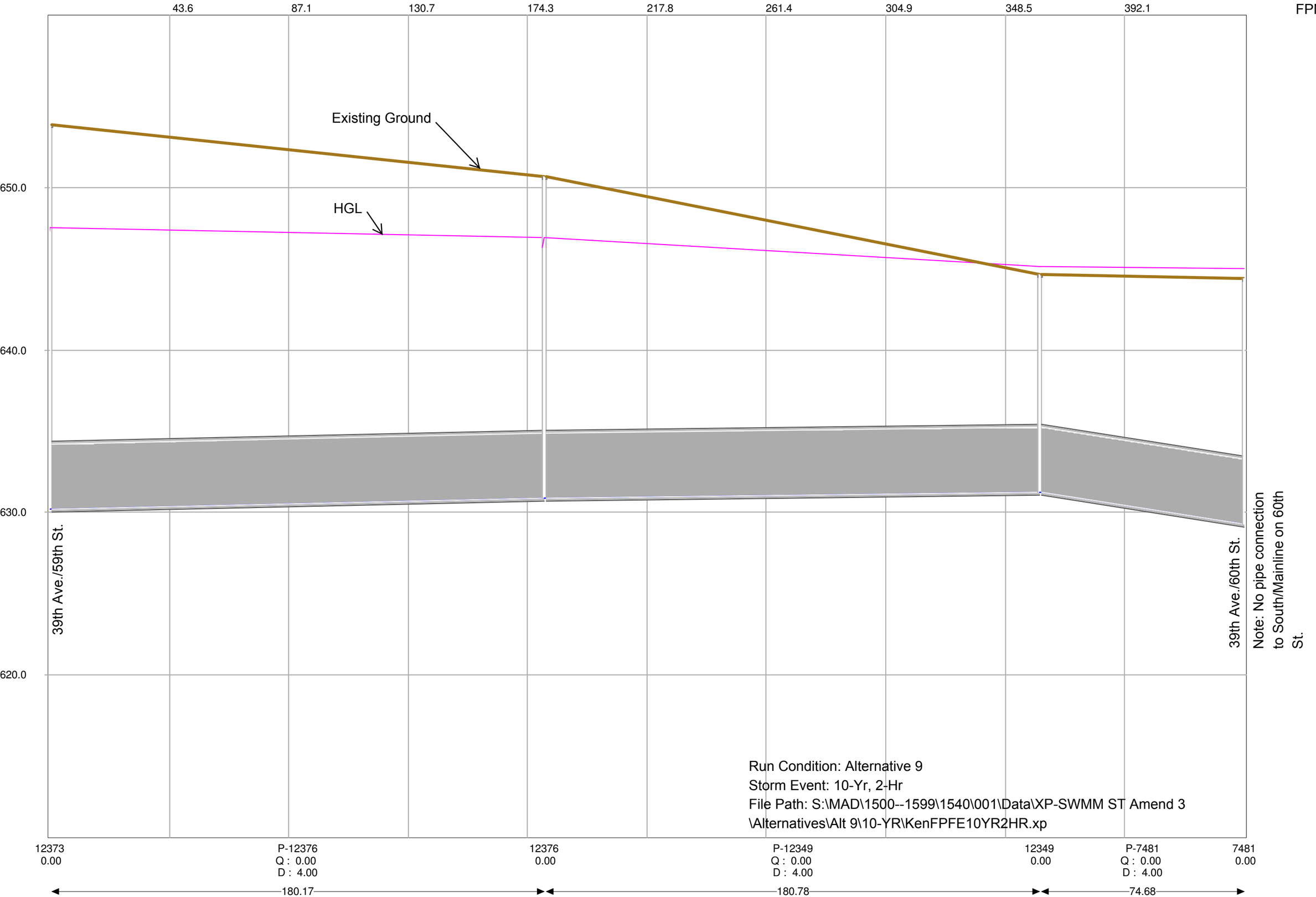
Untitled
Day [0] Time 00:01:00 Step 1

FPN P1



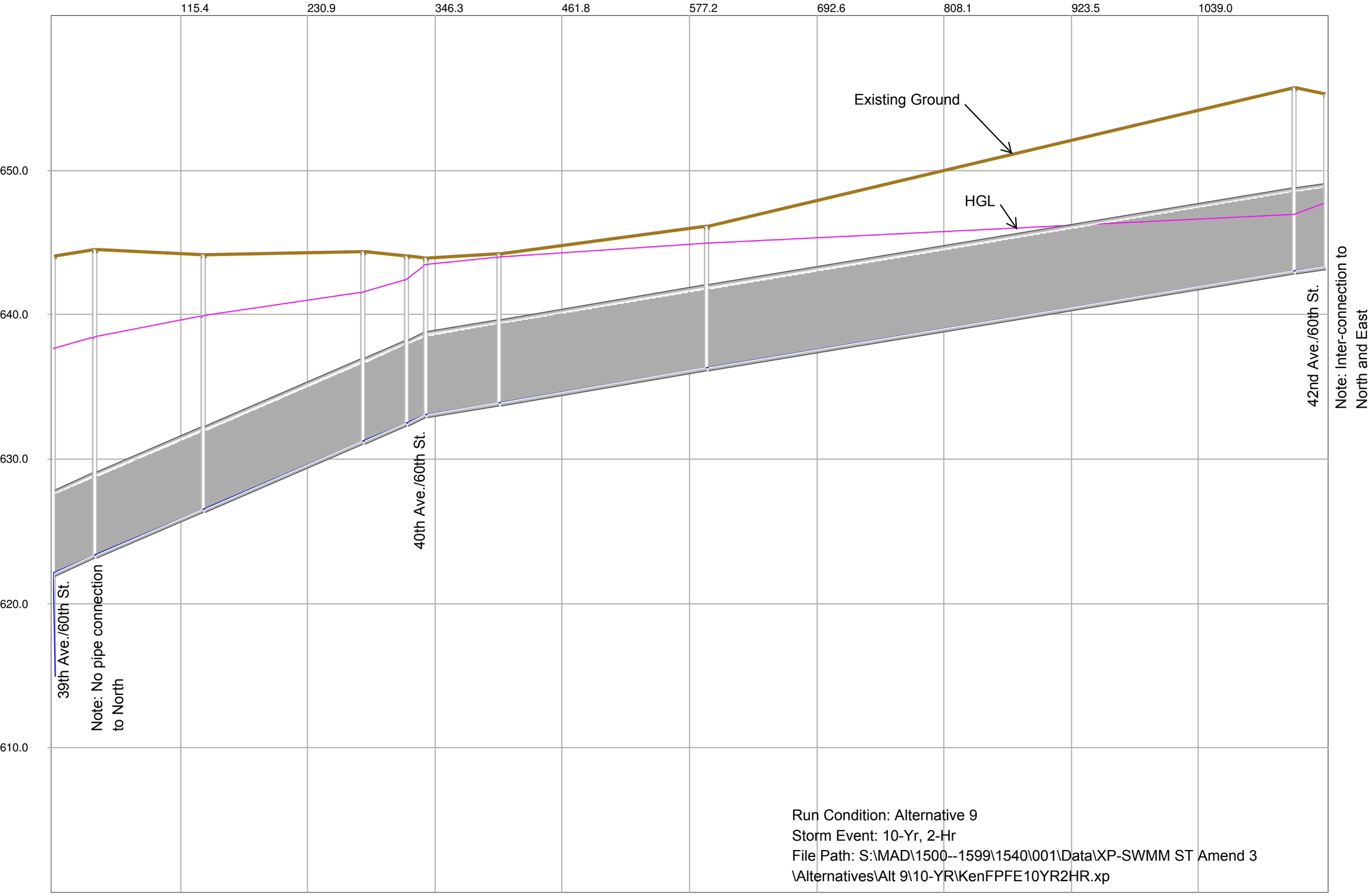
Untitled
Day [0] Time 00:01:00 Step 1

FPN P2



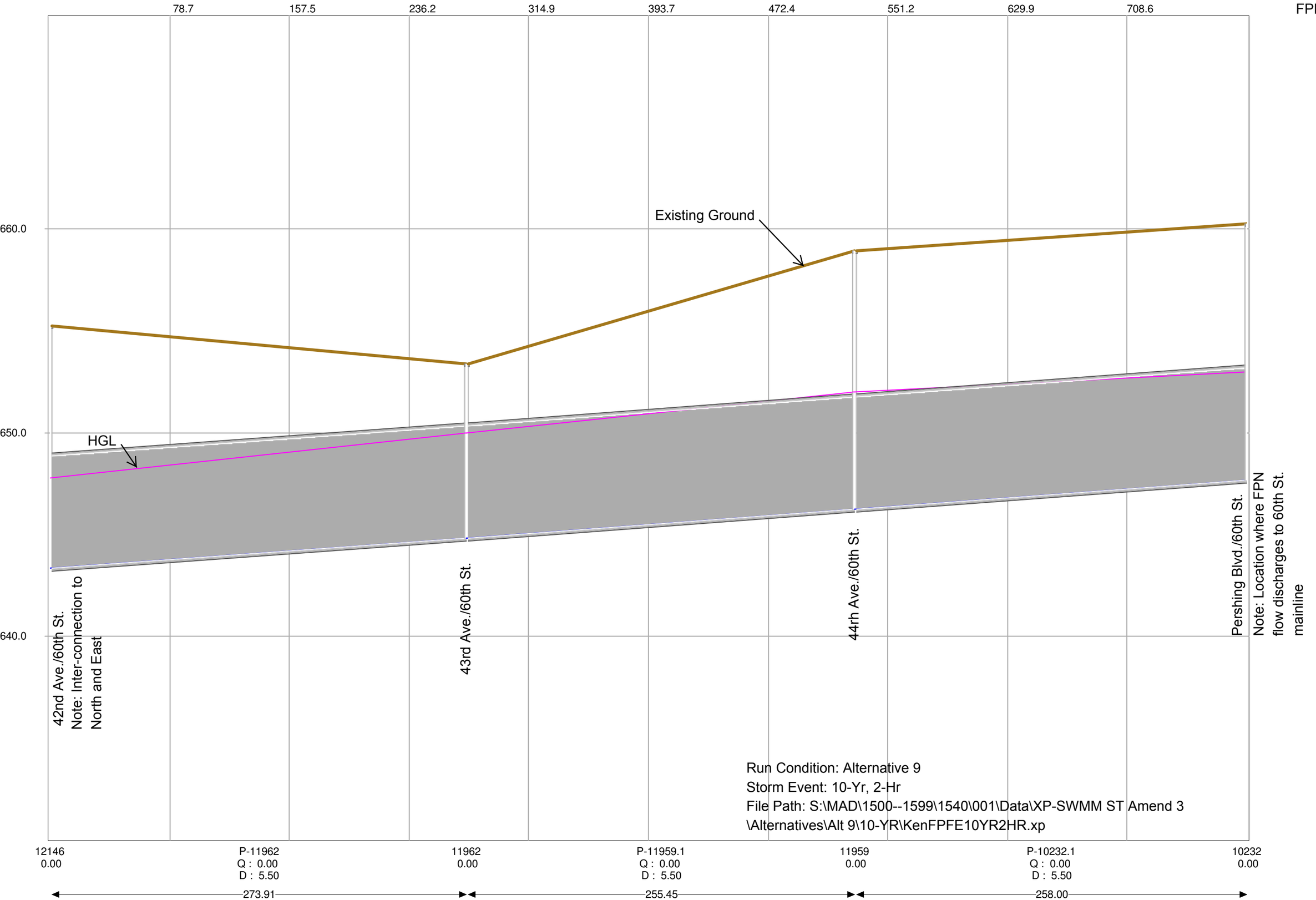
Untitled
Day [0] Time 00:01:00 Step 1

FPN P3



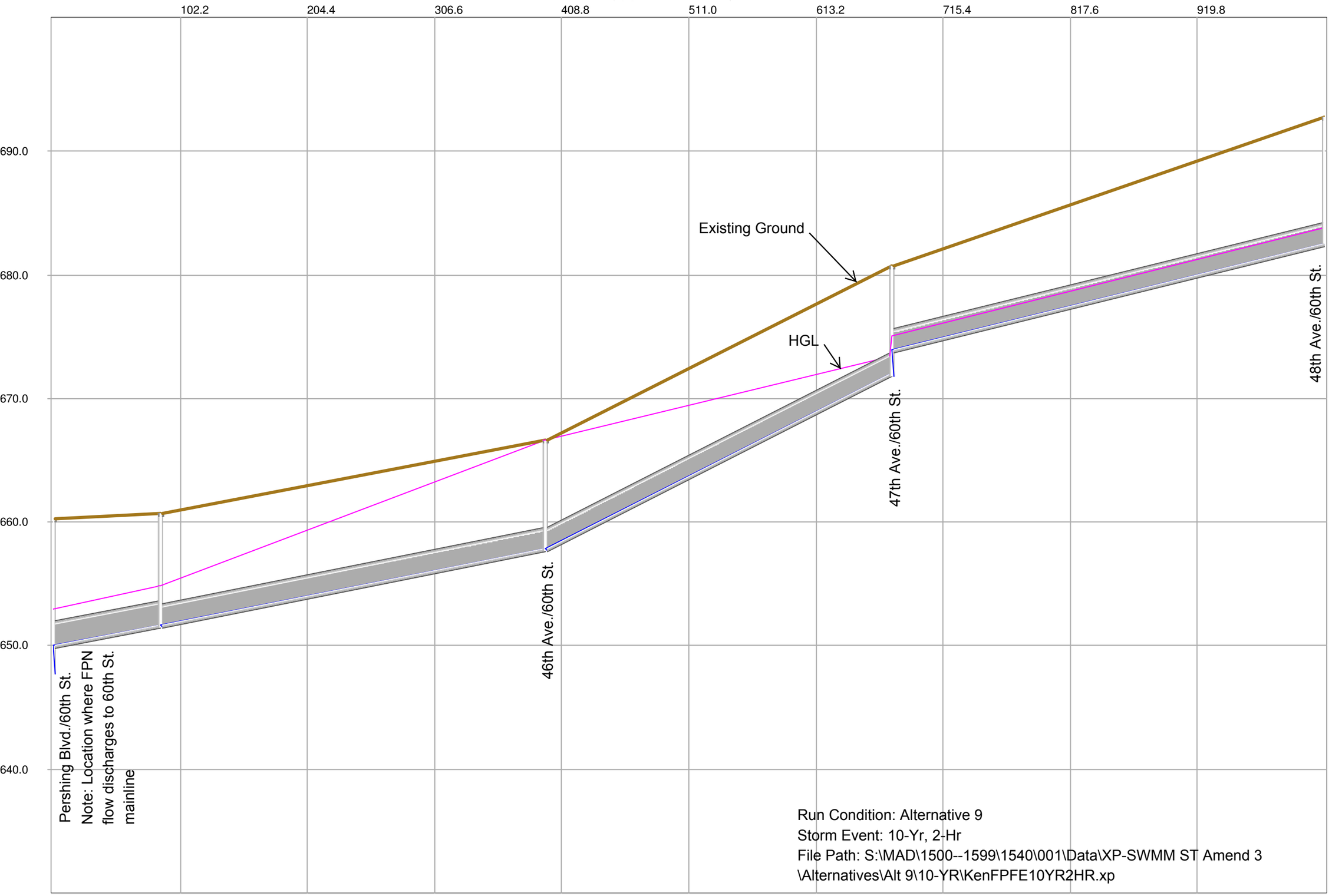
Untitled
Day [0] Time 00:01:00 Step 1

FPN P4



Untitled
Day [0] Time 00:01:00 Step 1

FPN P5

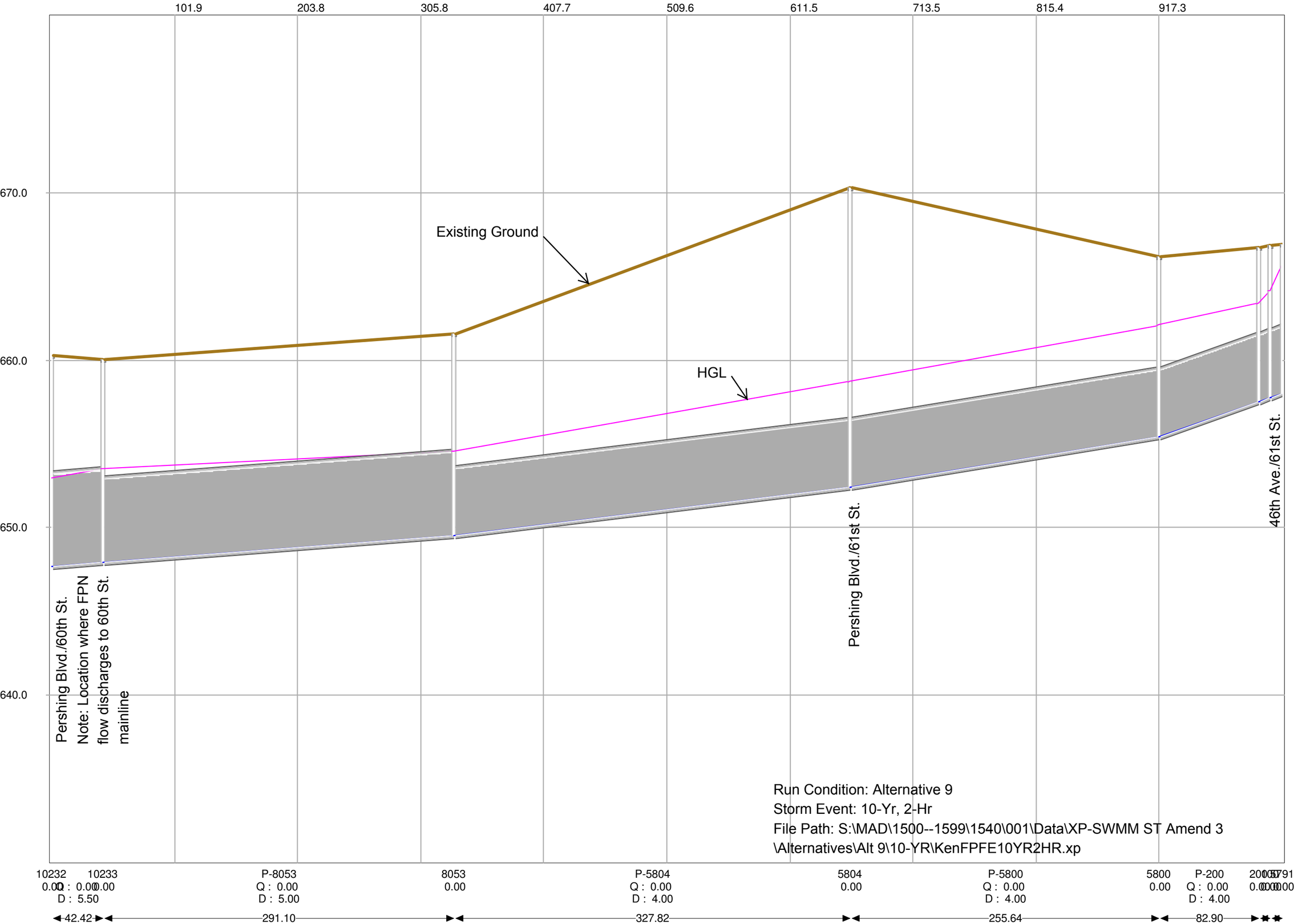


10232 0.00	P-10231.1 Q : 0.00 D : 1.75	10231 0.00	P-11763.1 Q : 0.00 D : 1.50	11763 0.00	P-11748 Q : 0.00 D : 1.50	11748 0.00	P-16964 Q : 0.00 D : 1.50	16964 0.00

86.35 | 309.15 | 279.12 | 347.40

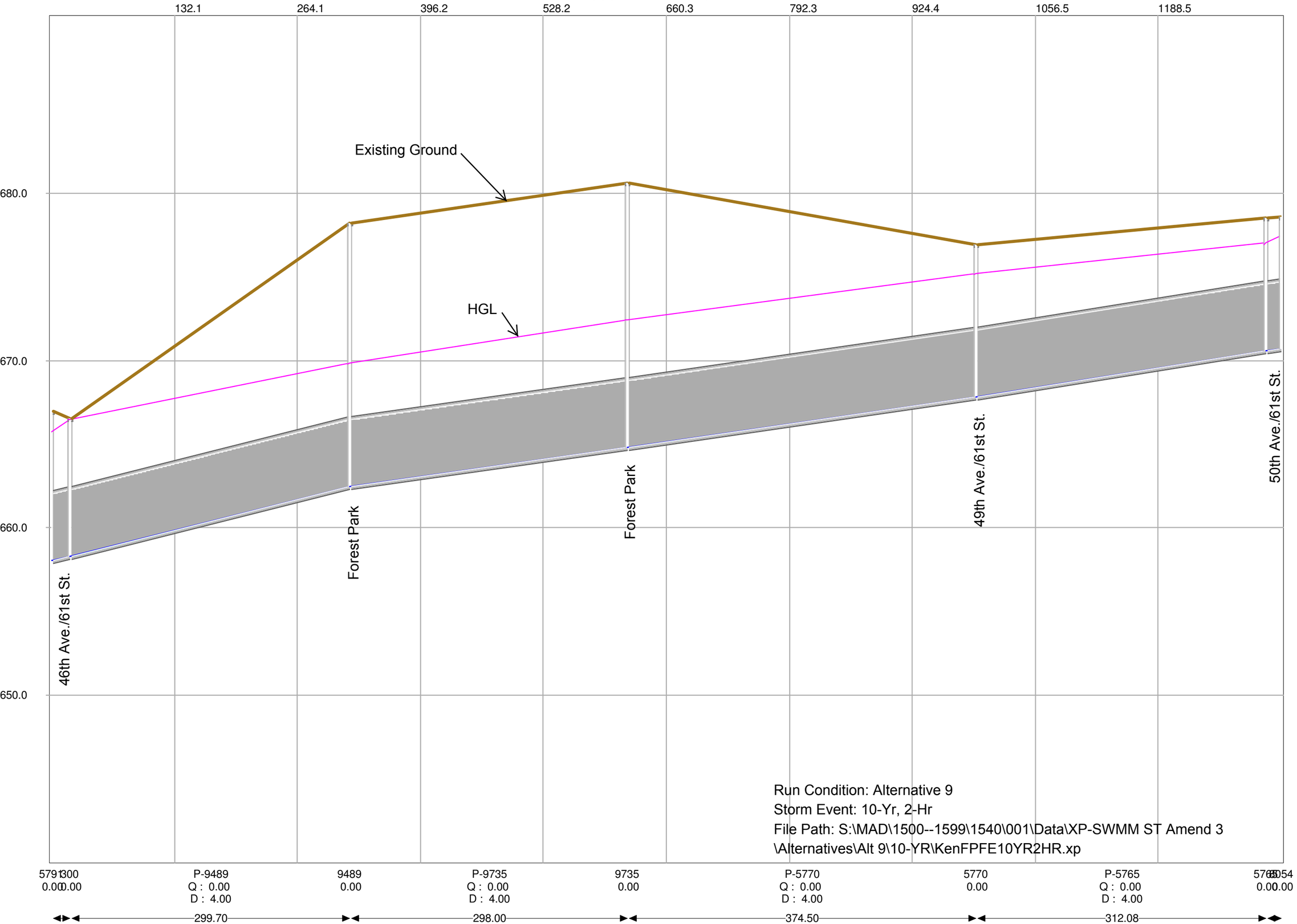
Untitled
Day [0] Time 00:01:00 Step 1

FPN P6



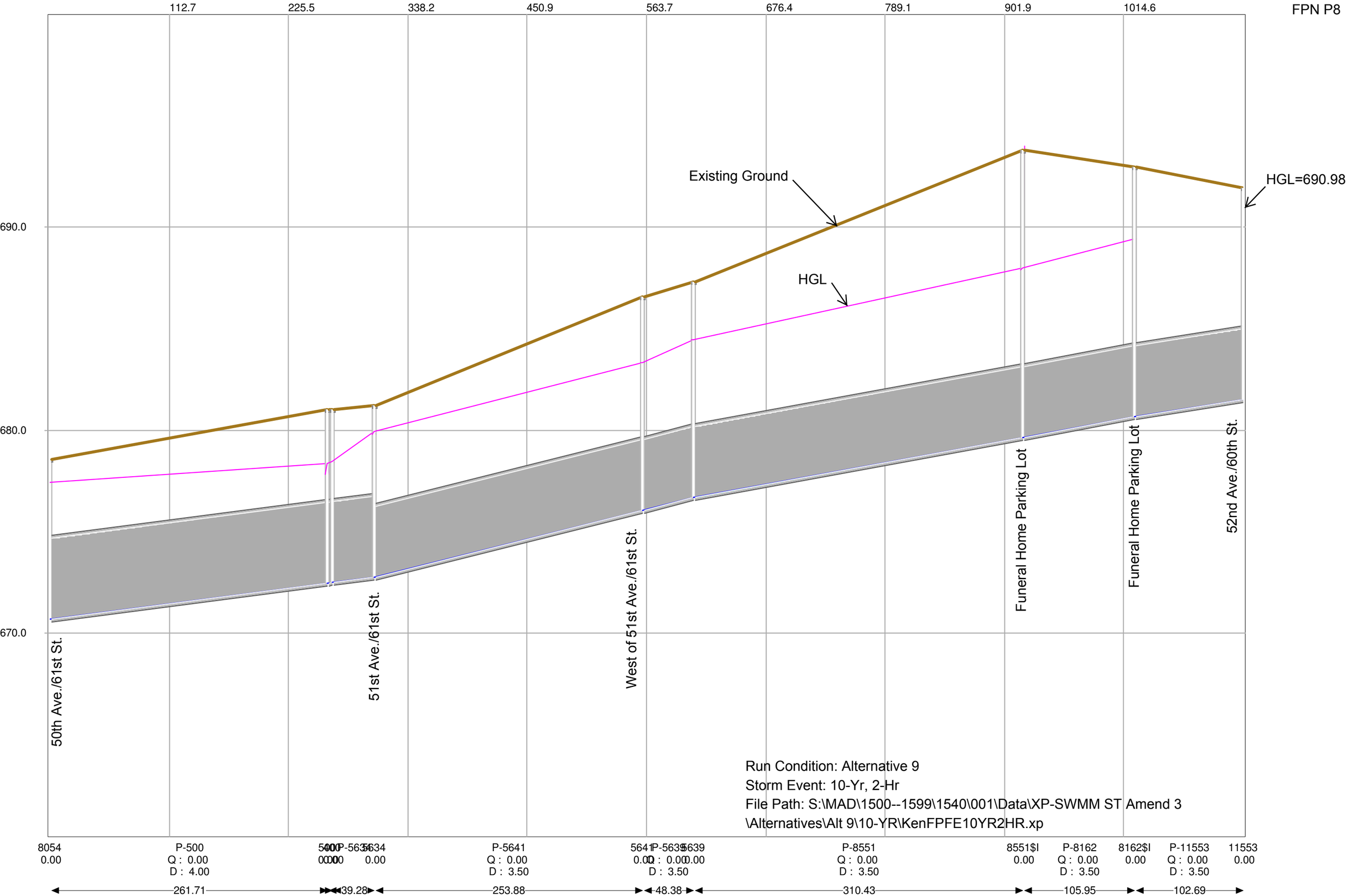
Untitled
Day [0] Time 00:01:00 Step 1

FPN P7



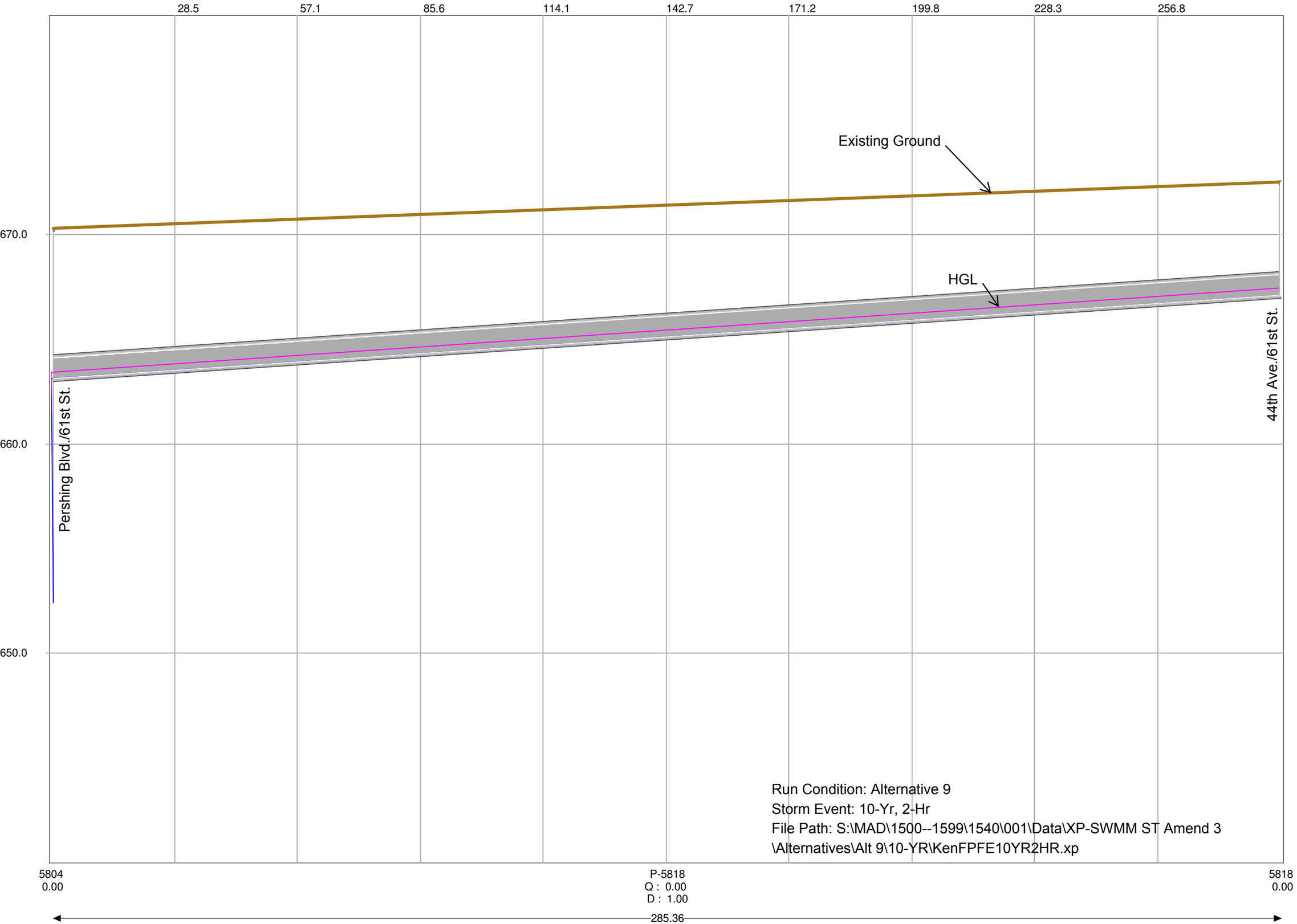
Untitled
Day [0] Time 00:01:00 Step 1

FPN P8



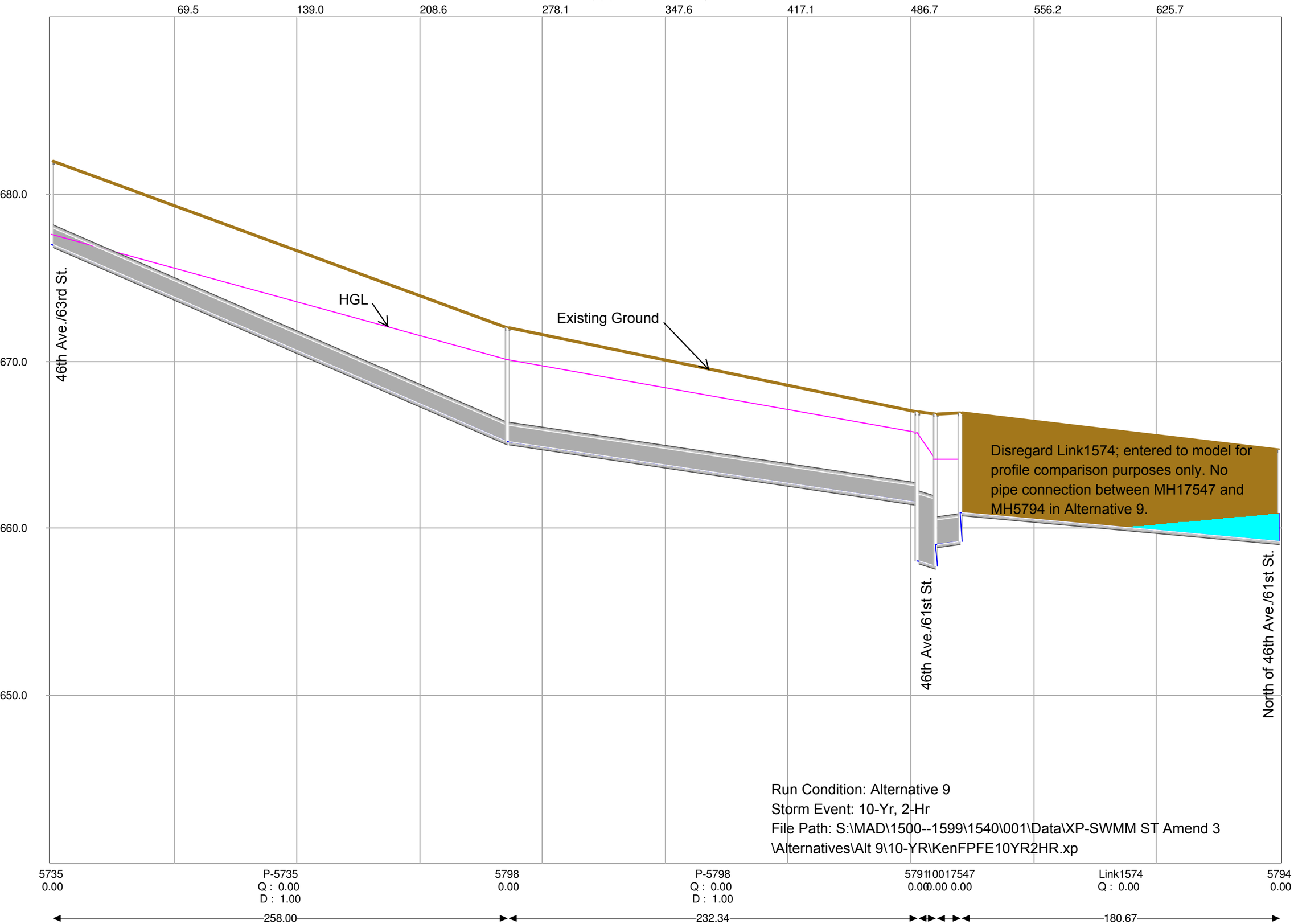
Untitled
Day [0] Time 00:01:00 Step 1

FPN P9

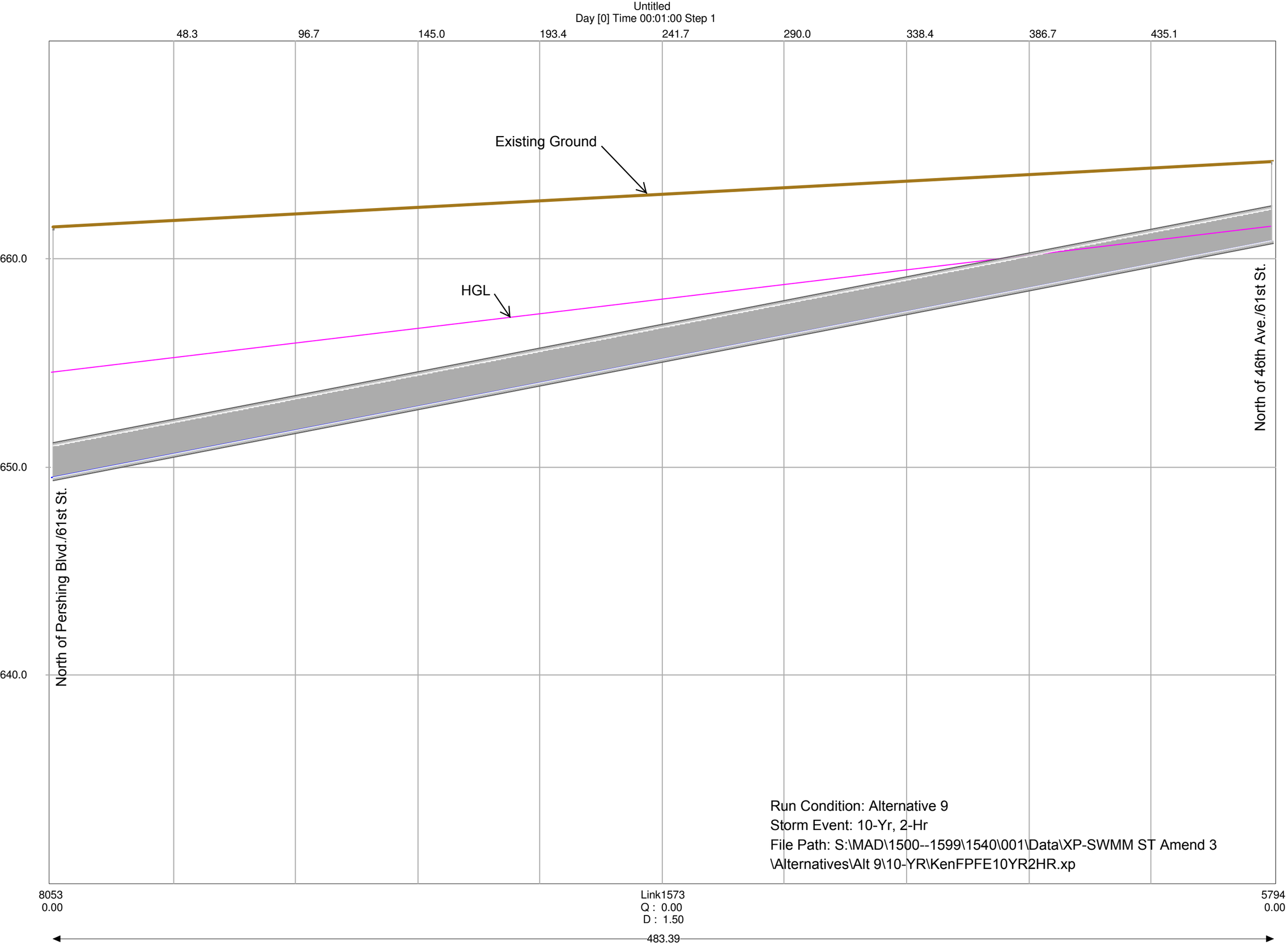


Untitled
Day [0] Time 00:01:00 Step 1

FPN P10

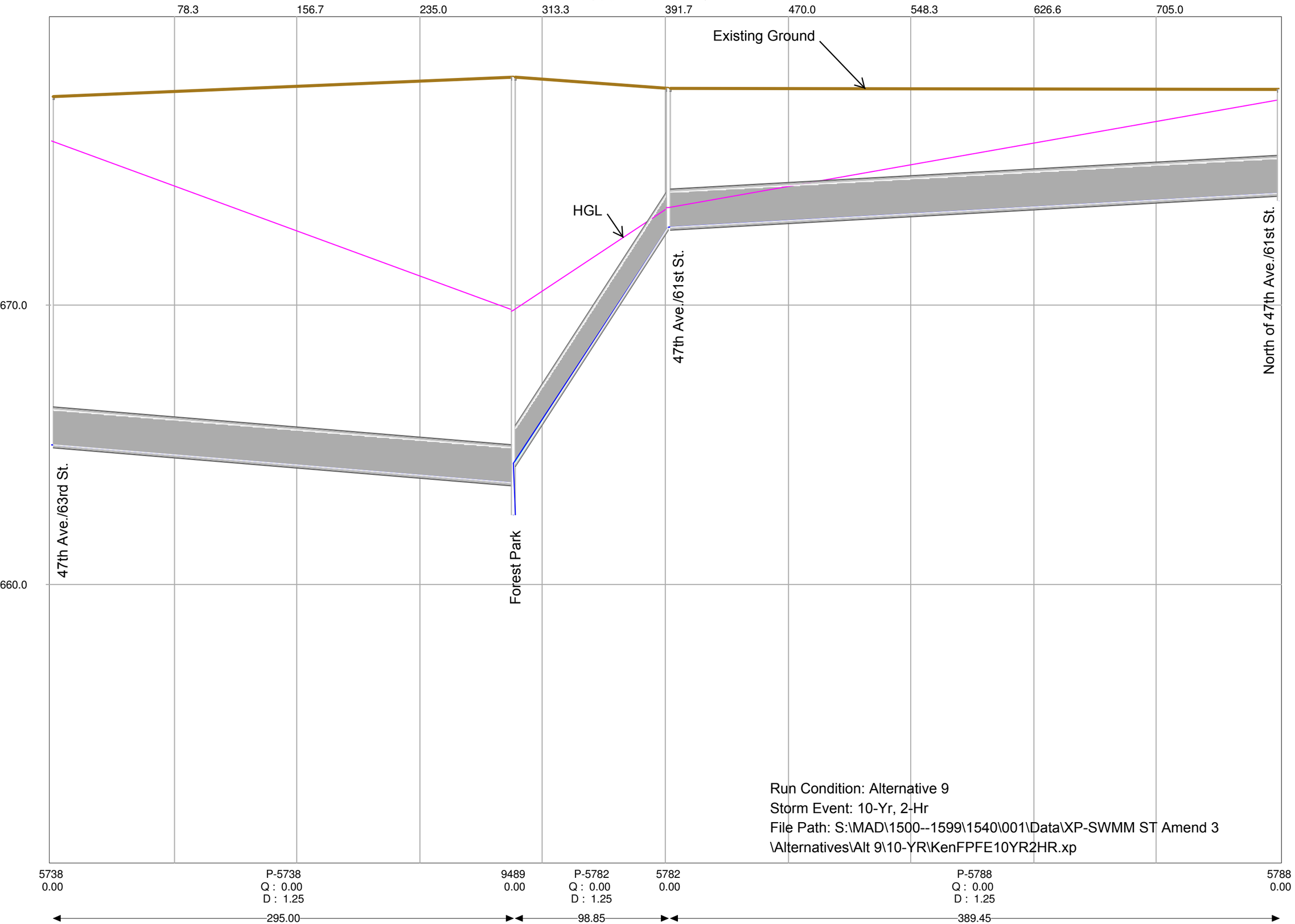


FPN P10A


Untitled
Day [0] Time 00:01:00 Step 1
48.3
96.7
145.0
193.4
241.7
290.0
338.4
386.7
435.1
Existing Ground
HGL
660.0
650.0
640.0
North of Pershing Blvd./61st St.
North of 46th Ave./61st St.
Run Condition: Alternative 9
Storm Event: 10-Yr, 2-Hr
File Path: S:\MAD\1500--1599\1540\001\Data\XP-SWMM ST Amend 3
\Alternatives\Alt 9\10-YR\KenFPFE10YR2HR.xp
8053
0.00
Link1573
Q : 0.00
D : 1.50
5794
0.00
483.39

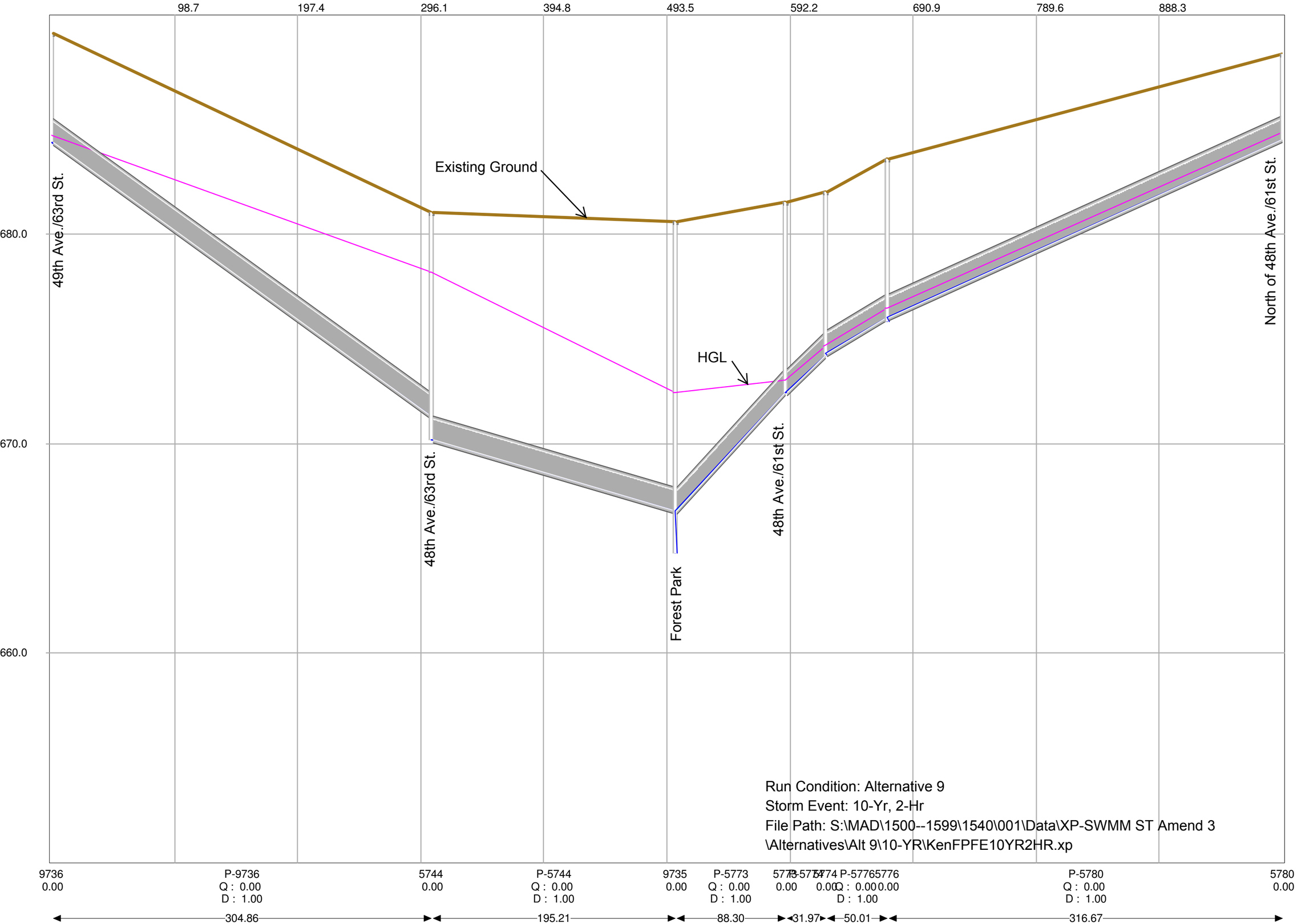
Untitled
Day [0] Time 00:01:00 Step 1

FPN P11



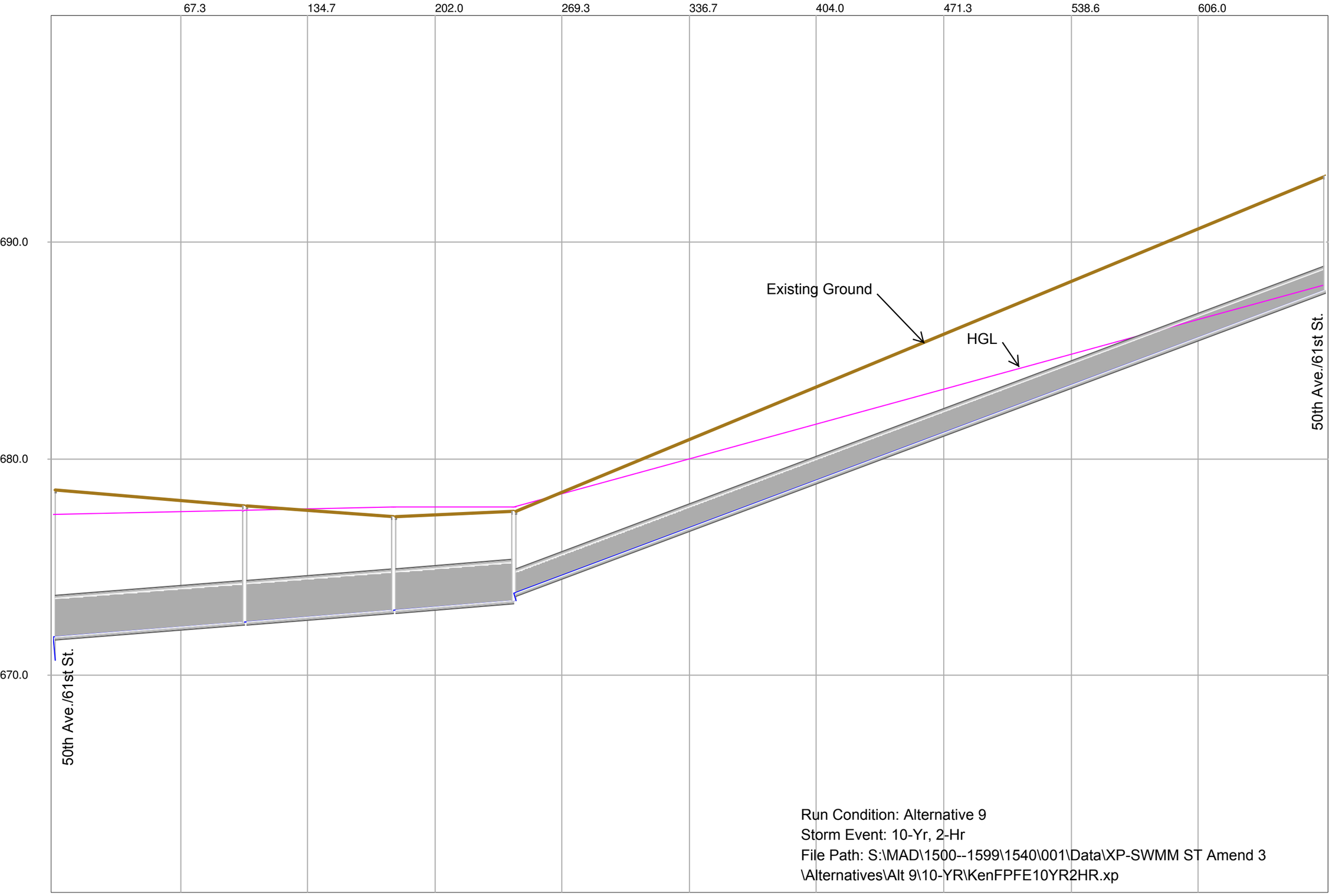
Untitled
Day [0] Time 00:01:00 Step 1

FPN P12



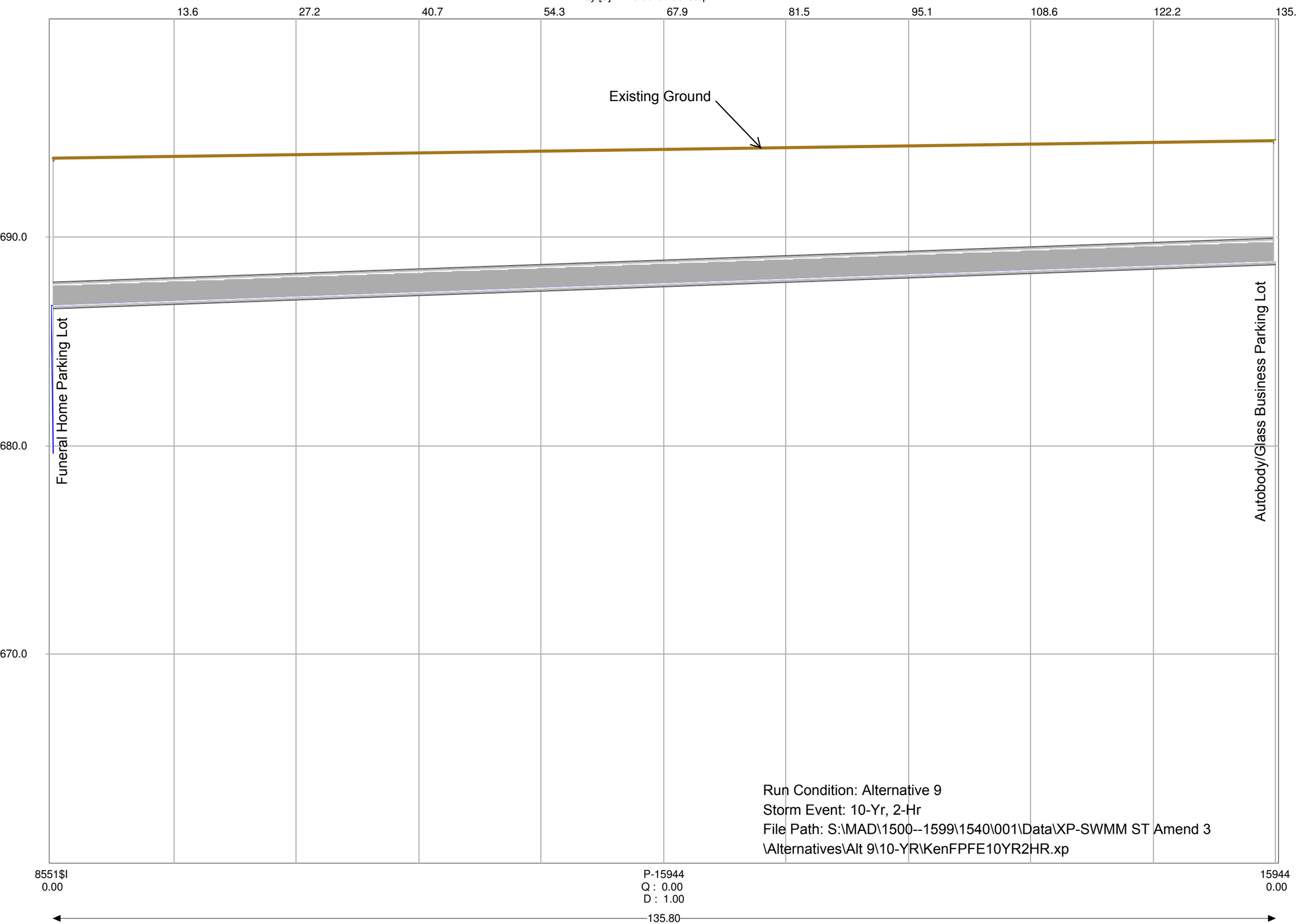
Untitled
Day [0] Time 00:01:00 Step 1

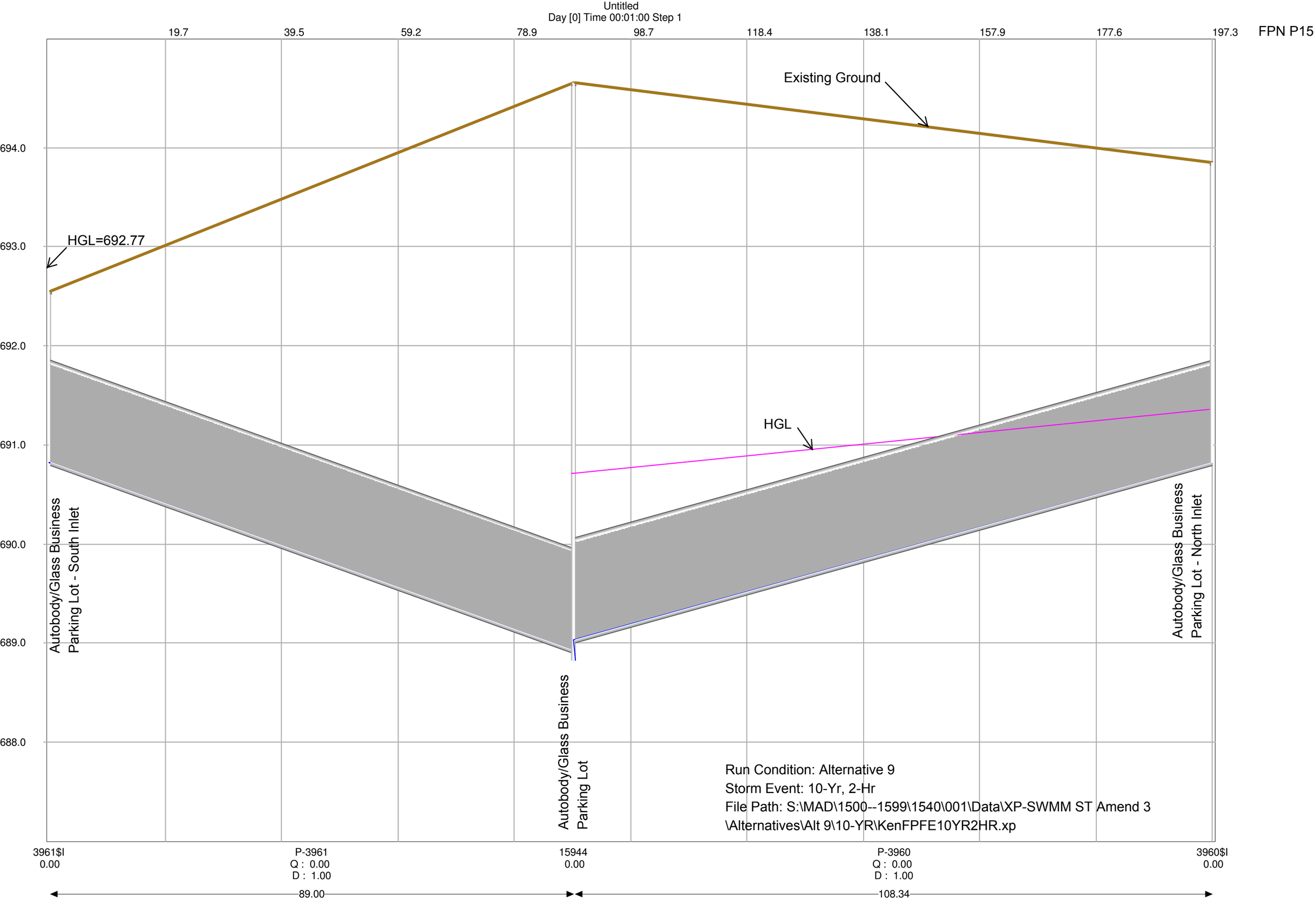
FPN P13



Untitled
Day [0] Time 00:01:00 Step 1

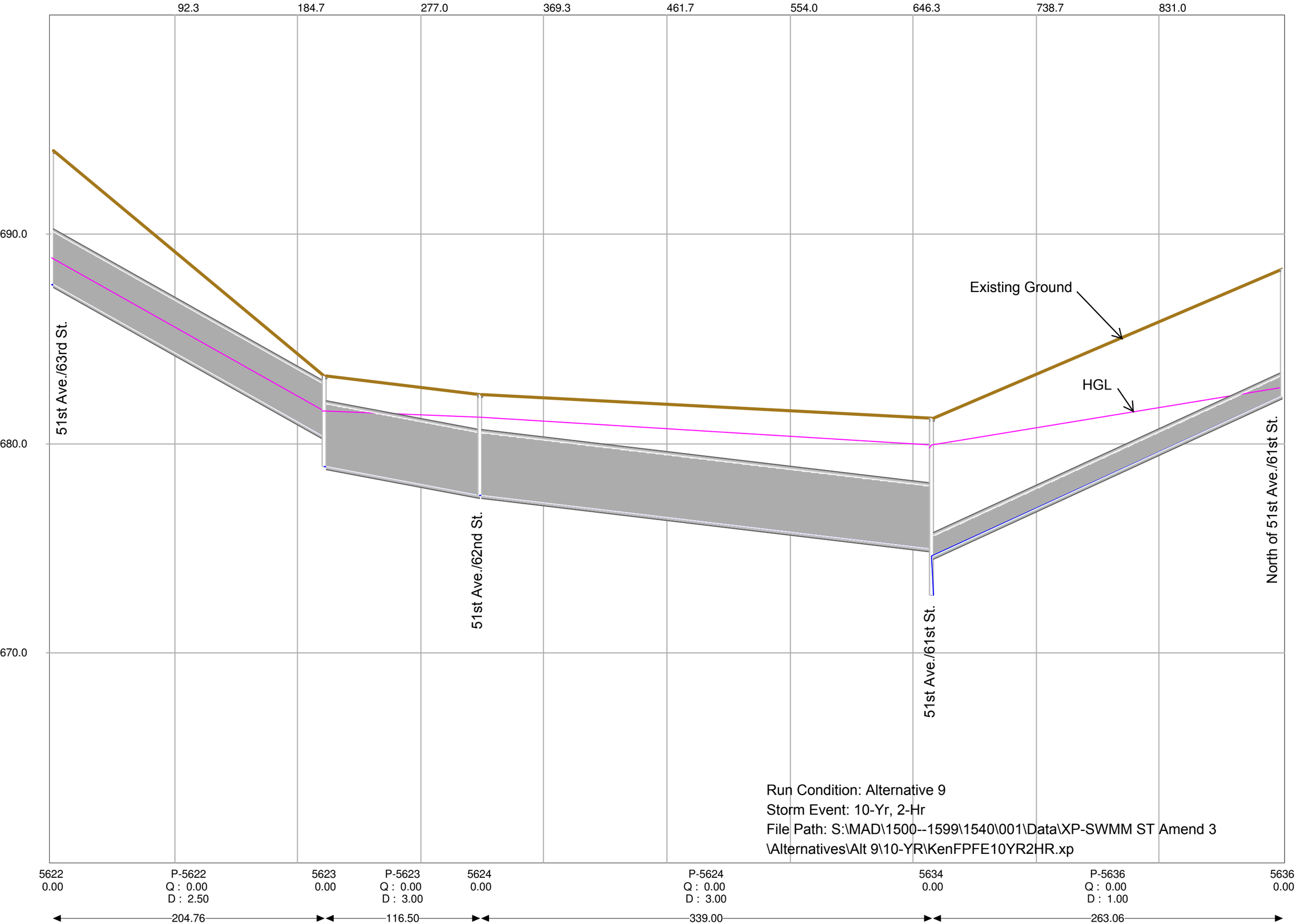
FPN P14




Untitled
Day [0] Time 00:01:00 Step 1
FPN P15
19.7
39.5
59.2
78.9
98.7
118.4
138.1
157.9
177.6
197.3
694.0
693.0
692.0
691.0
690.0
689.0
688.0
Existing Ground
HGL=692.77
HGL
Autobody/Glass Business Parking Lot - South Inlet
Autobody/Glass Business Parking Lot
Autobody/Glass Business Parking Lot - North Inlet
Run Condition: Alternative 9
Storm Event: 10-Yr, 2-Hr
File Path: S:\MAD\1500--1599\1540\001\Data\XP-SWMM ST Amend 3
\Alternatives\Alt 9\10-YR\KenFPFE10YR2HR.xp
3961$I
0.00
P-3961
Q : 0.00
D : 1.00
15944
0.00
P-3960
Q : 0.00
D : 1.00
3960$I
0.00
89.00
108.34

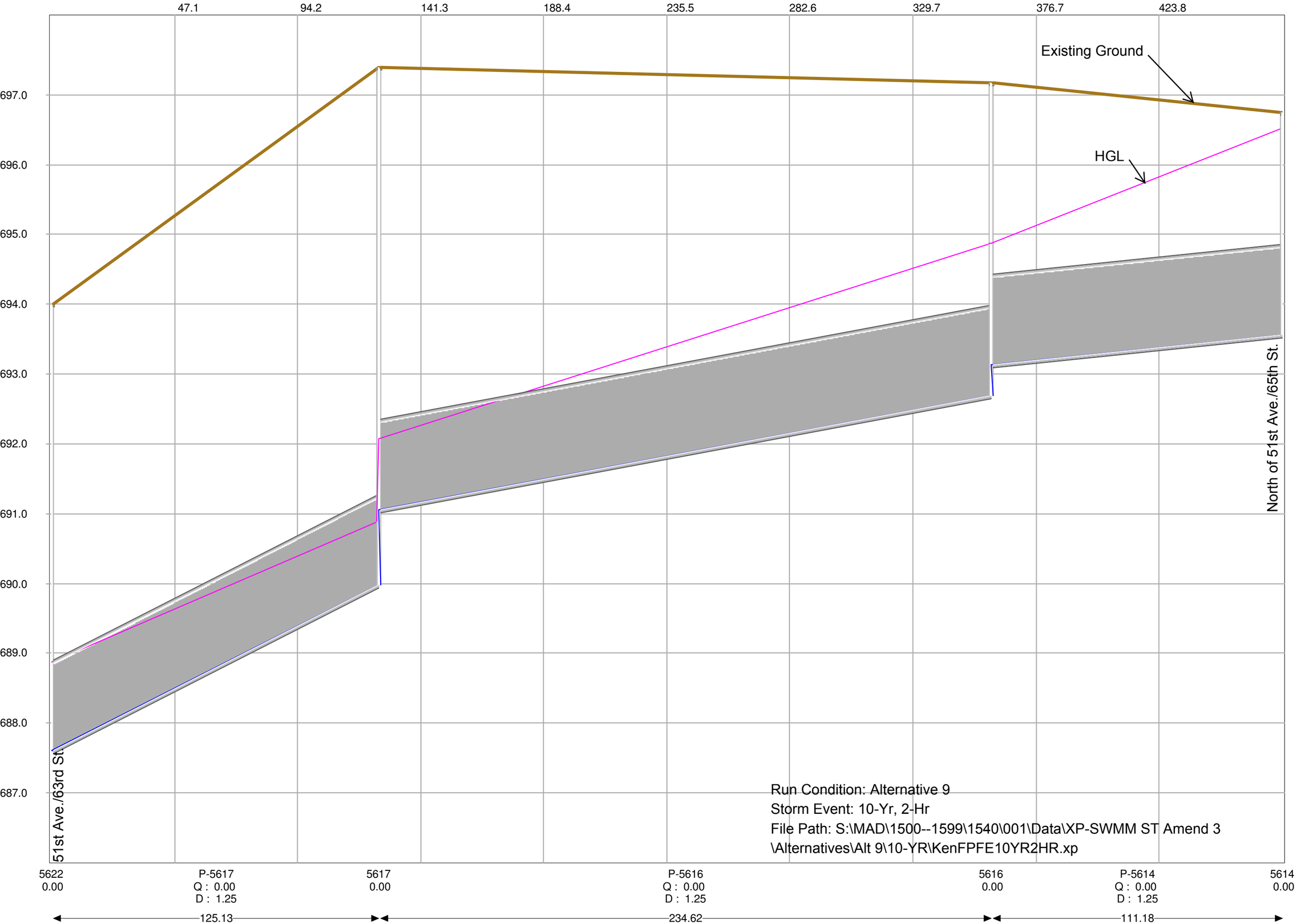
Untitled
Day [0] Time 00:01:00 Step 1

FPN P16



Untitled
Day [0] Time 00:01:00 Step 1

FPN P17



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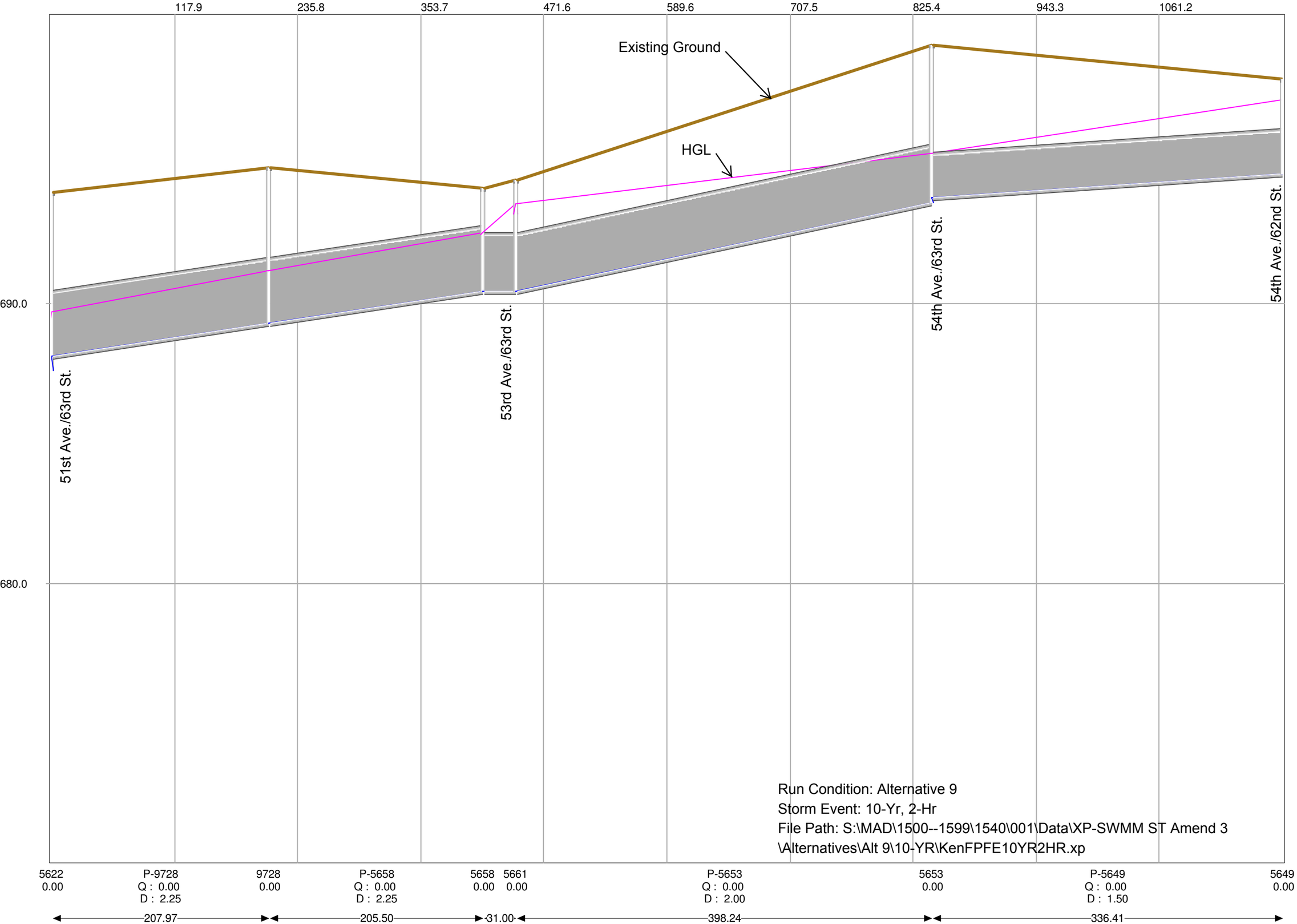
Day [0] Time 00:01:00 Step 1

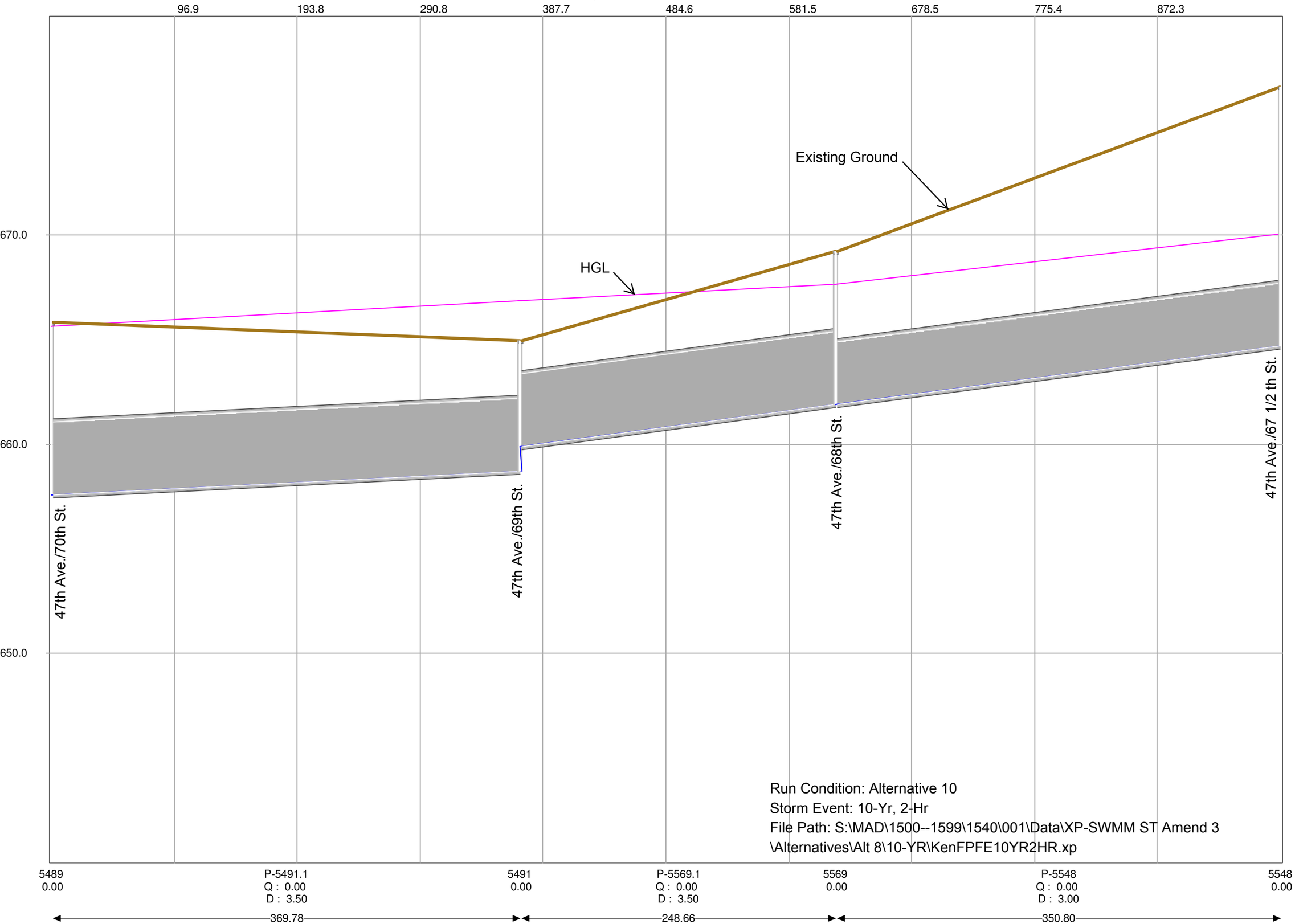
FPN P18



APPENDIX P
ALTERNATIVE 10: 10-YEAR STORM EVENT
MAINLINE PROFILES (FOREST PARK NORTH)

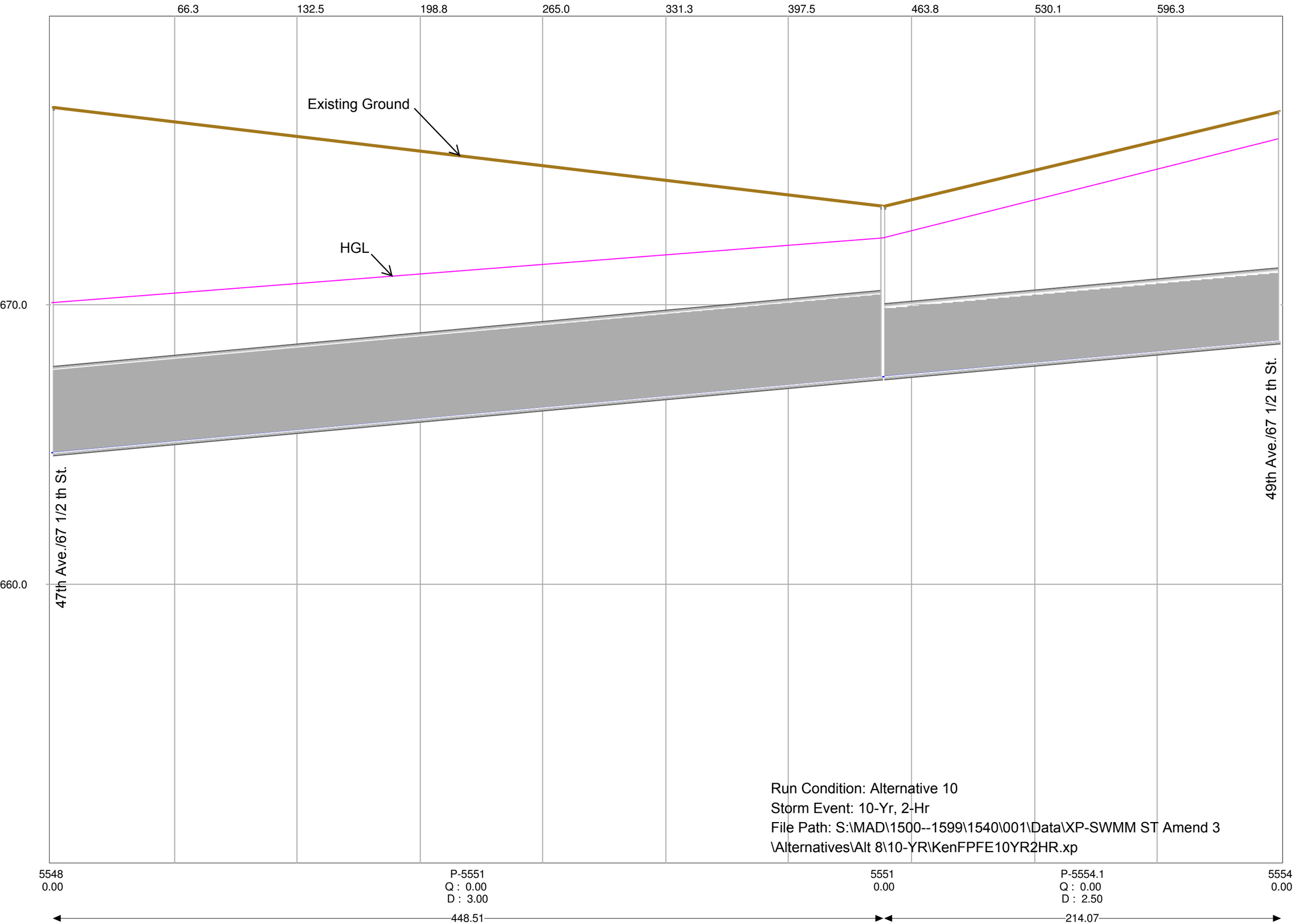
Untitled
Day [0] Time 00:01:00 Step 1

FPS P1



Untitled
Day [0] Time 00:01:00 Step 1

FPS P2



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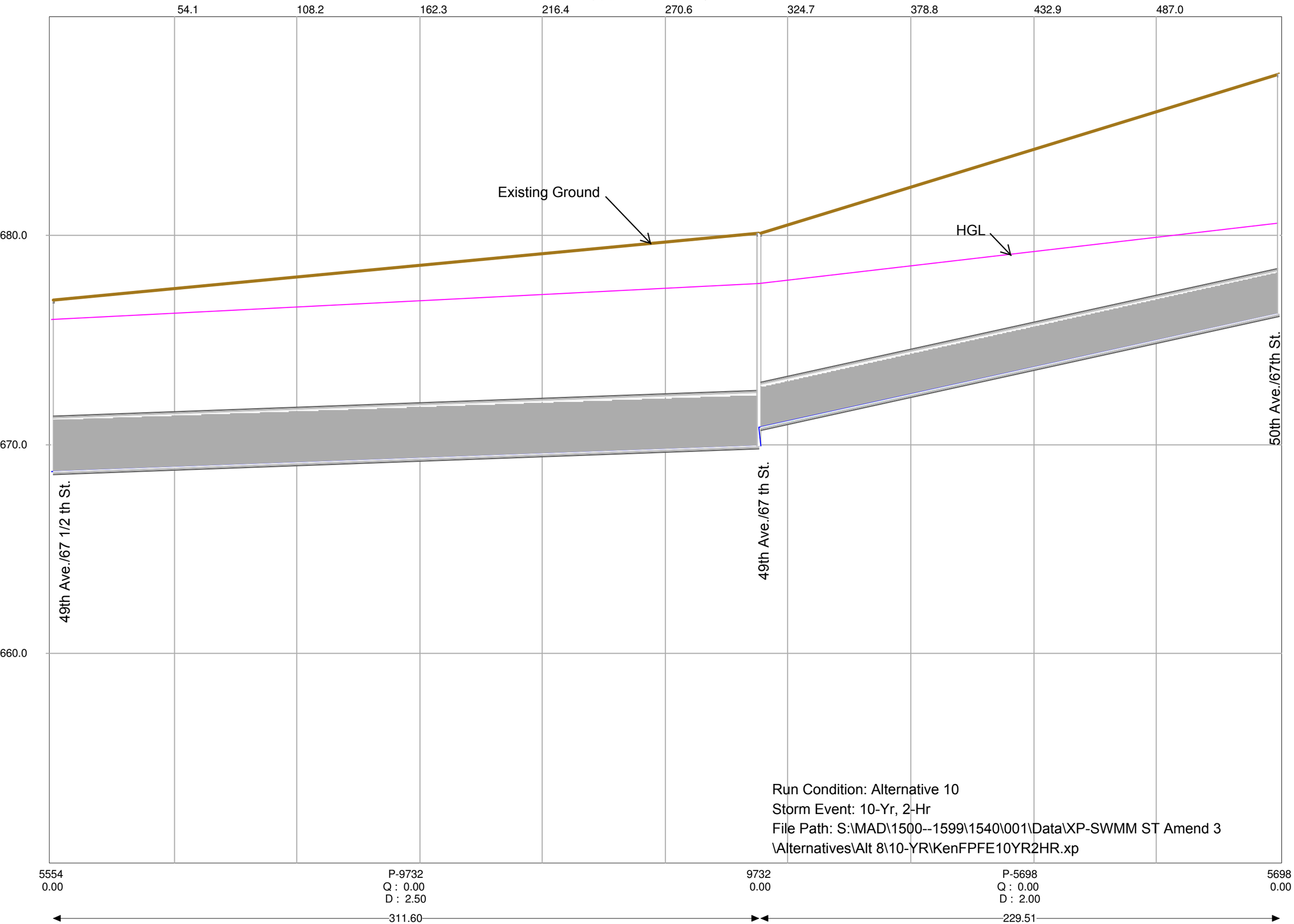
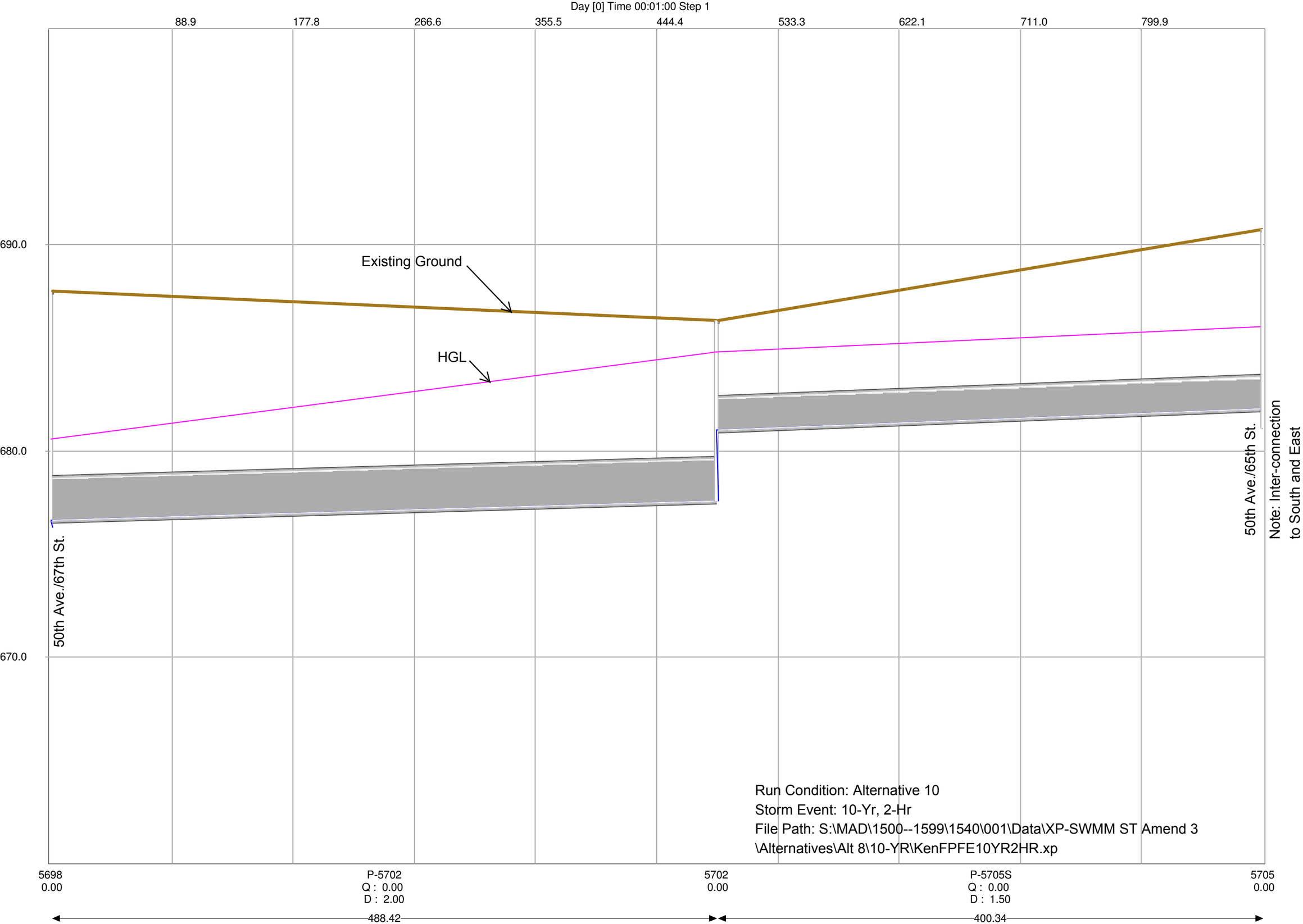
Day [0] Time 00:01:00 Step 1

FPS P3



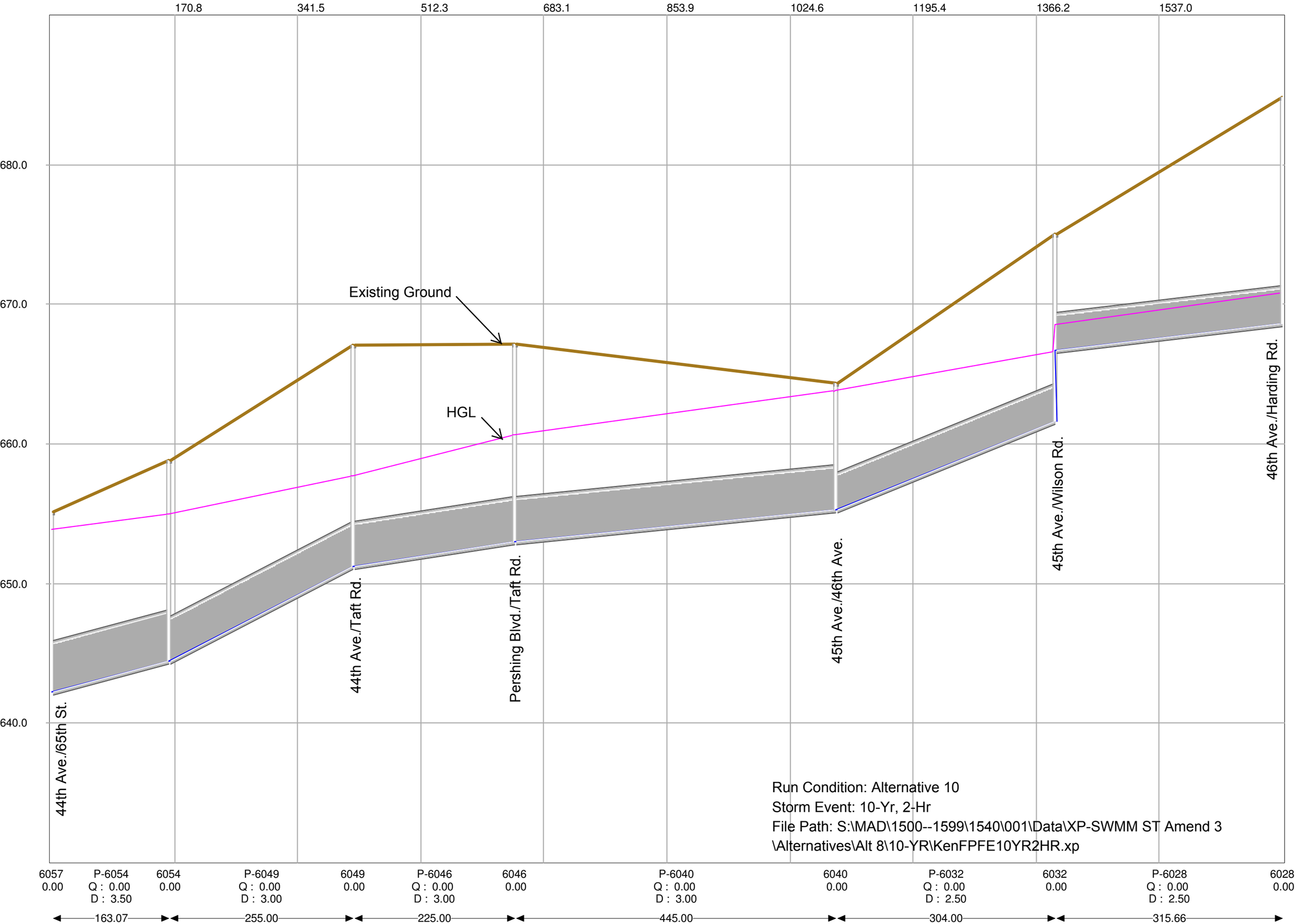
Untitled
Day [0] Time 00:01:00 Step 1

FPS P4



Untitled
Day [0] Time 00:01:00 Step 1

FPS P5



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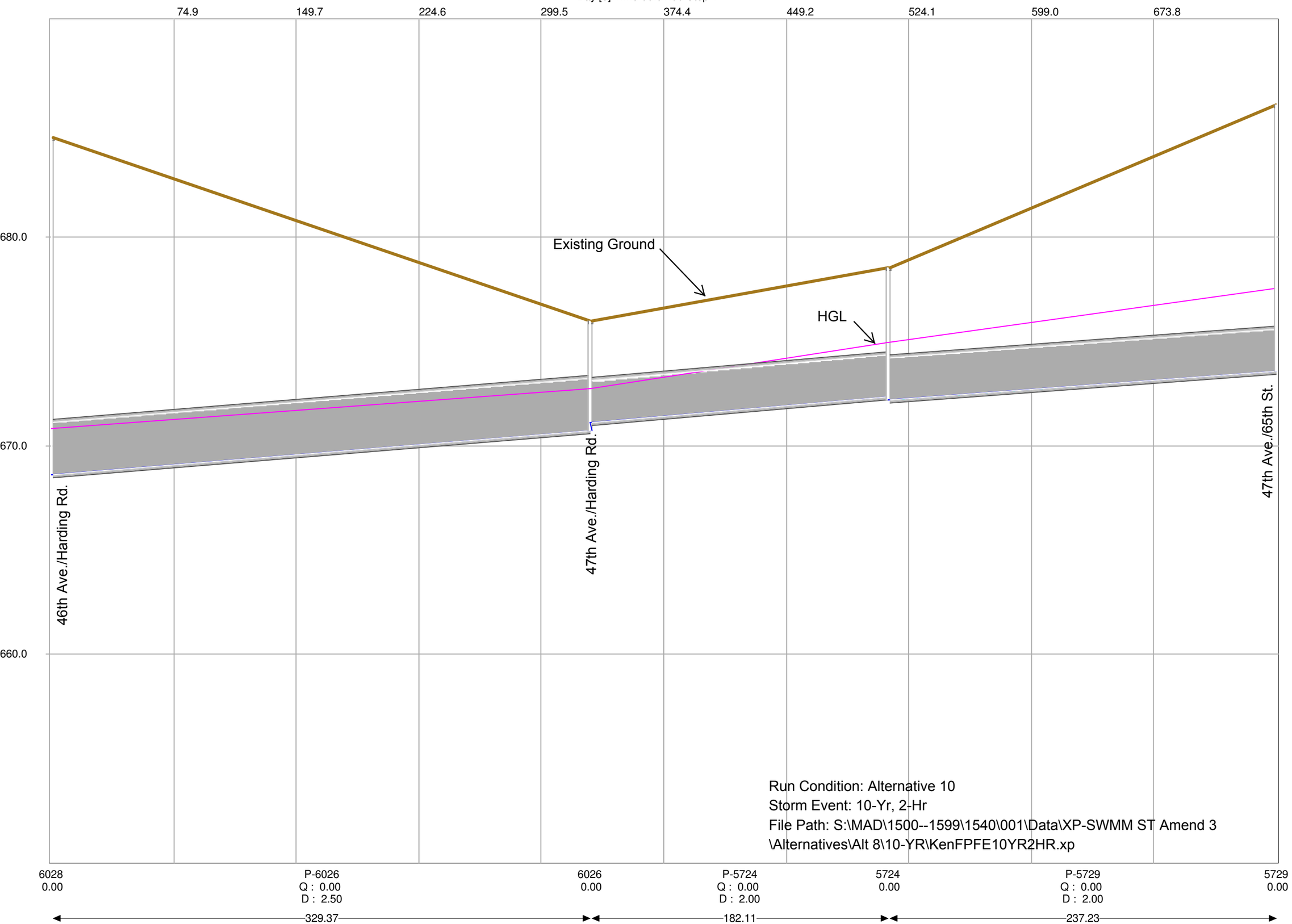
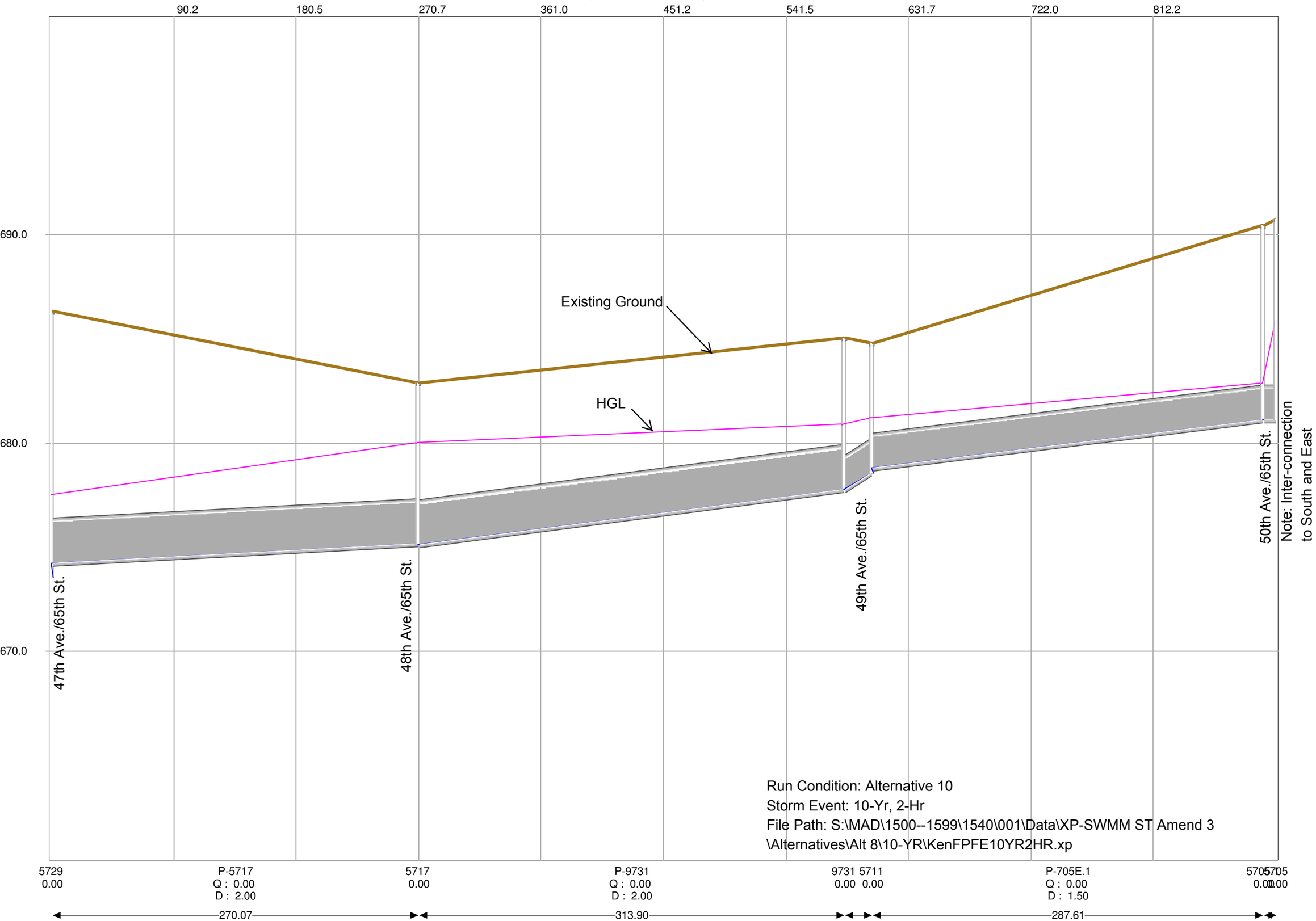
Day [0] Time 00:01:00 Step 1

FPS P6



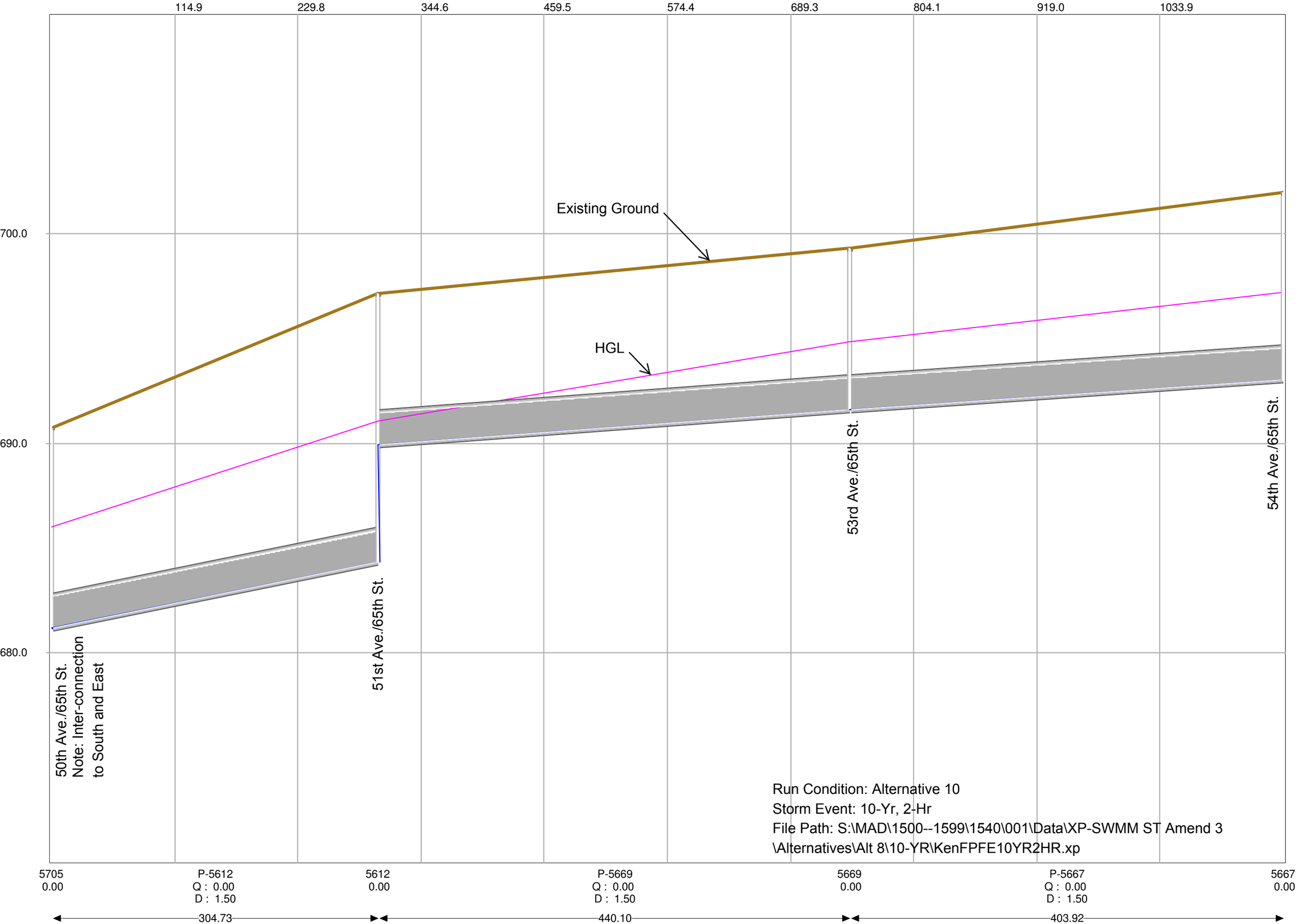
Untitled
Day [0] Time 00:01:00 Step 1

FPS P7



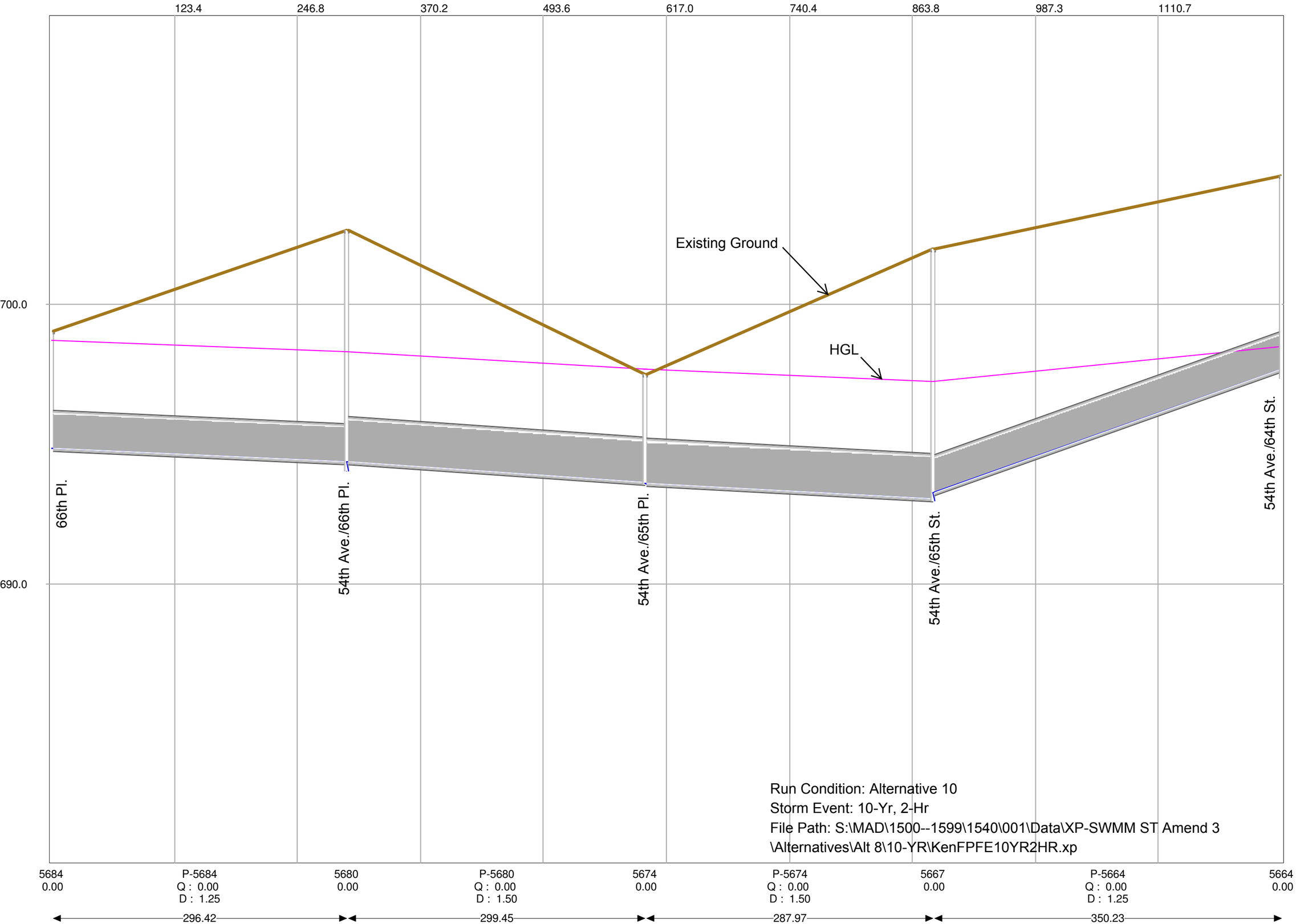
Untitled
Day [0] Time 00:01:00 Step 1

FPS P8



Untitled
Day [0] Time 00:01:00 Step 1

FPS P9



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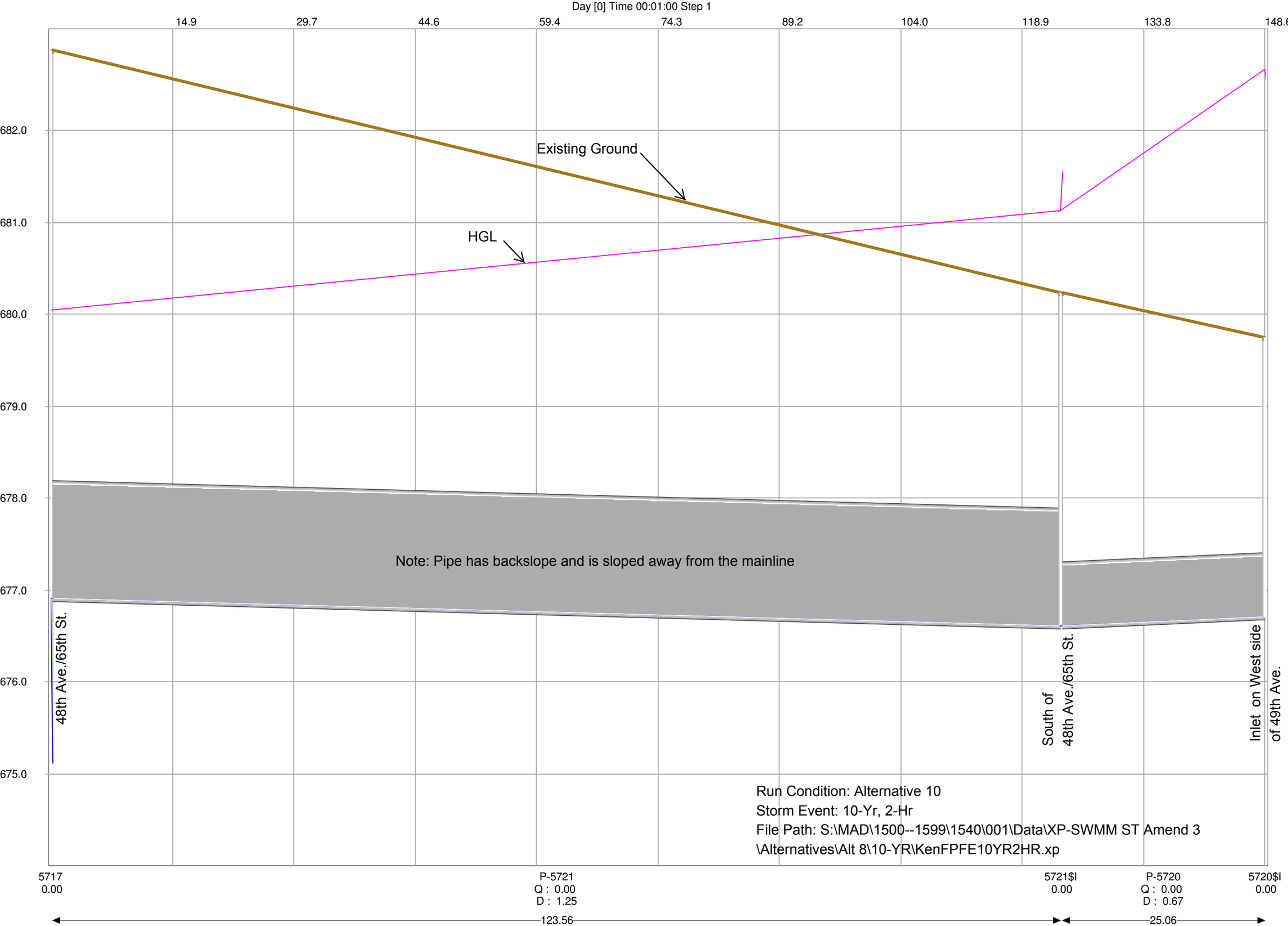
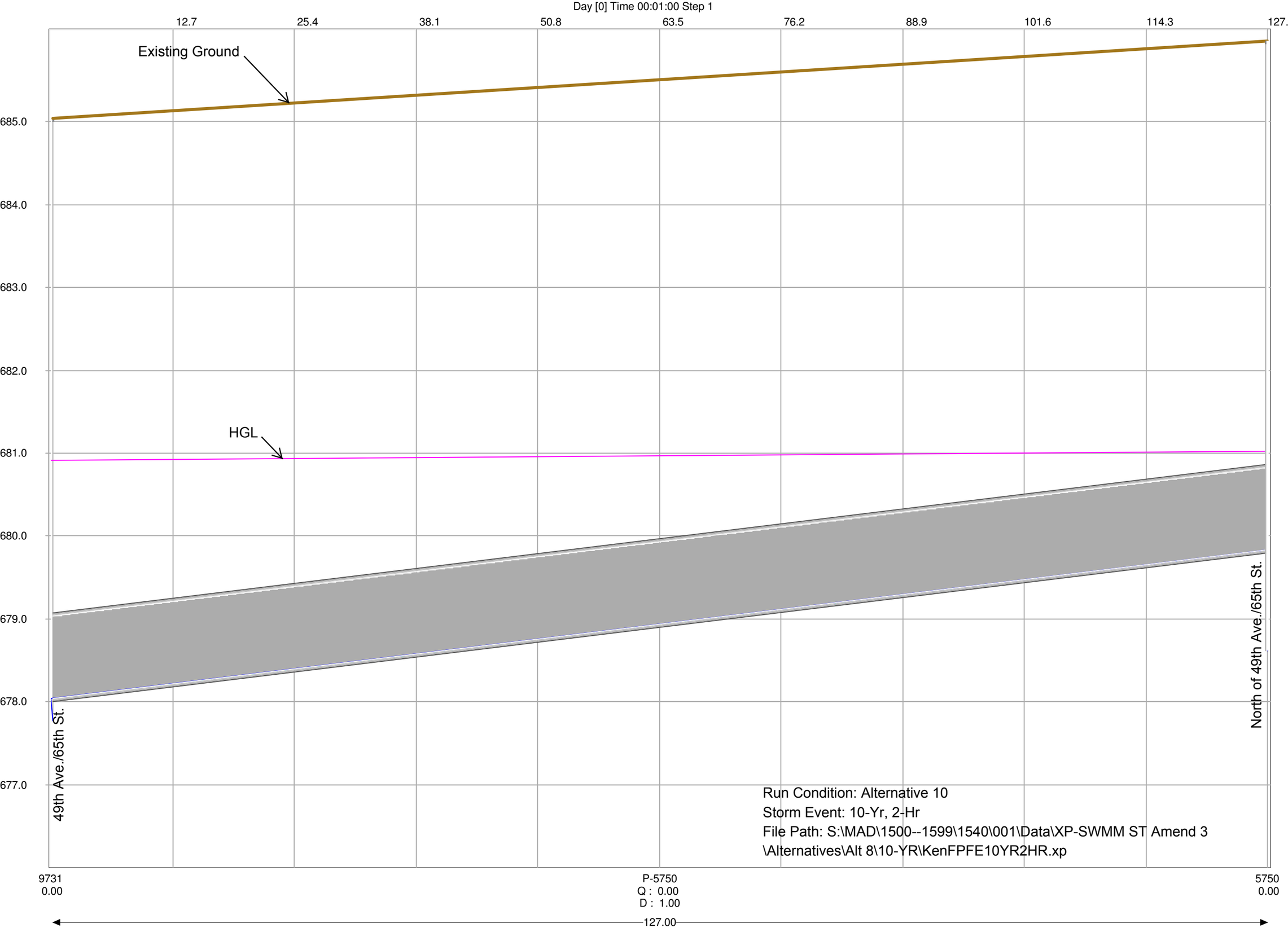
Day [0] Time 00:01:00 Step 1

FPS P10



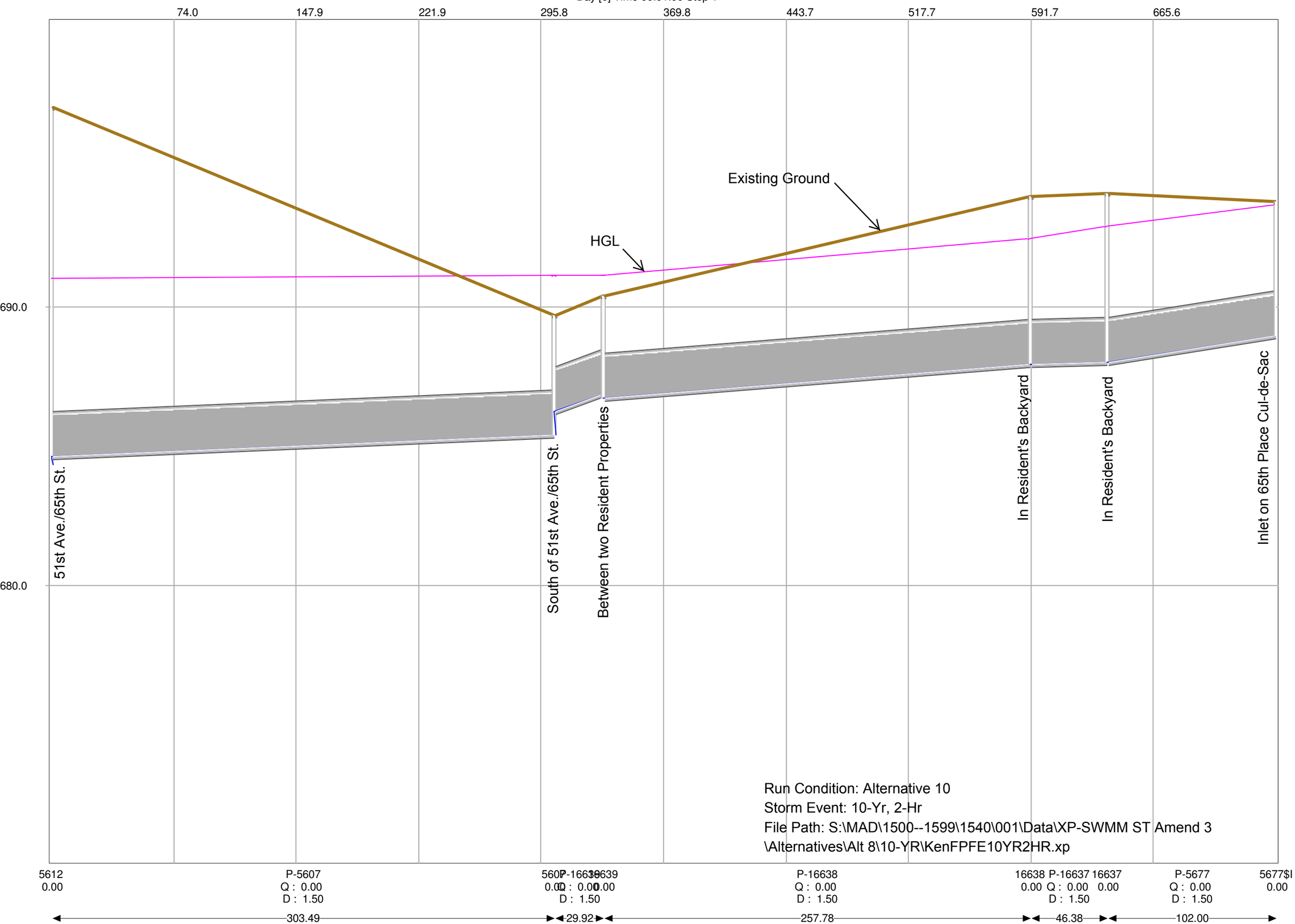
Untitled
Day [0] Time 00:01:00 Step 1

FPS P11



Untitled
Day [0] Time 00:01:00 Step 1

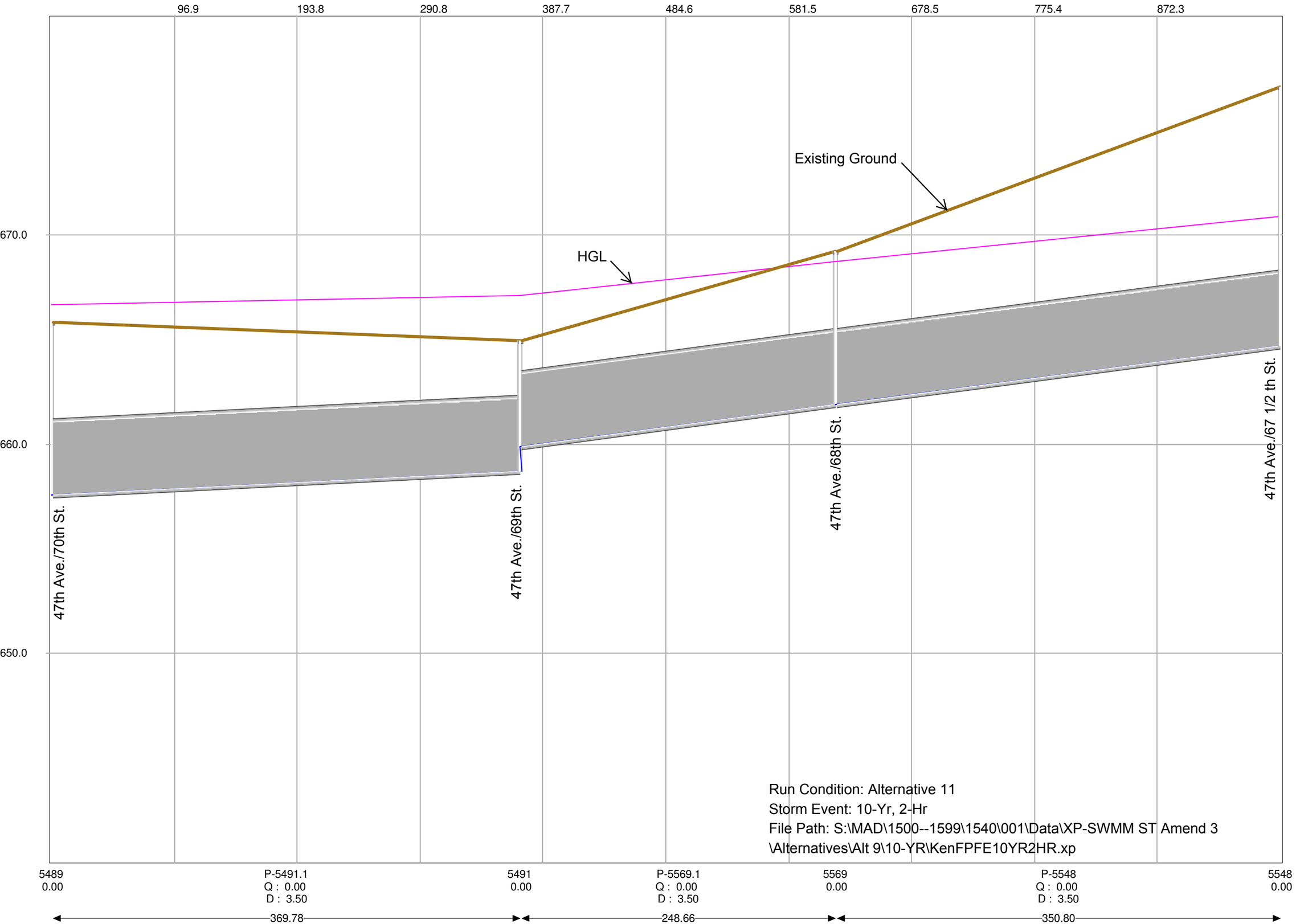
FPS P12



APPENDIX Q
ALTERNATIVE 11: 10-YEAR STORM EVENT MAINLINE PROFILES (FOREST PARK SOUTH)

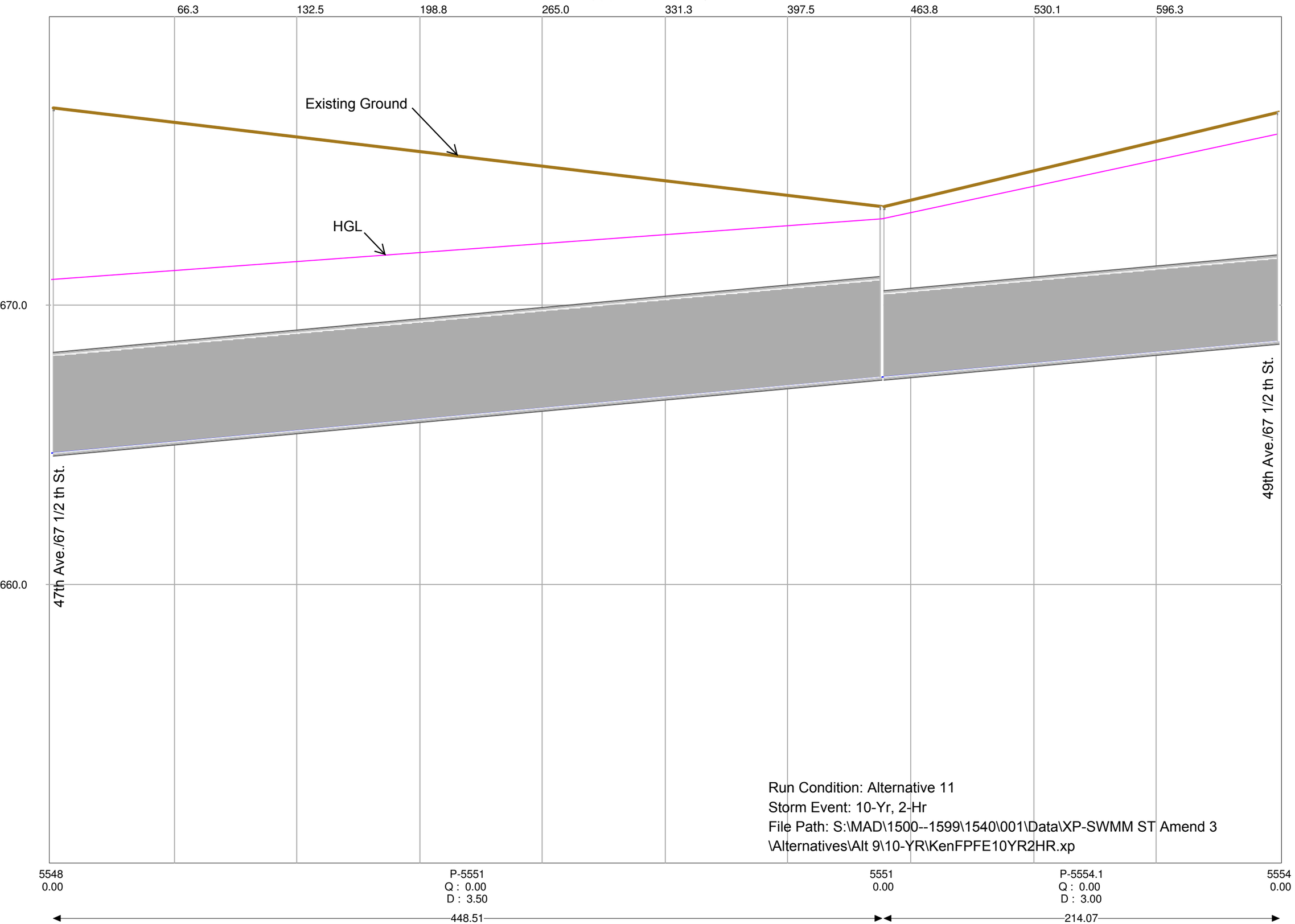
Untitled
Day [0] Time 00:01:00 Step 1

FPS P1



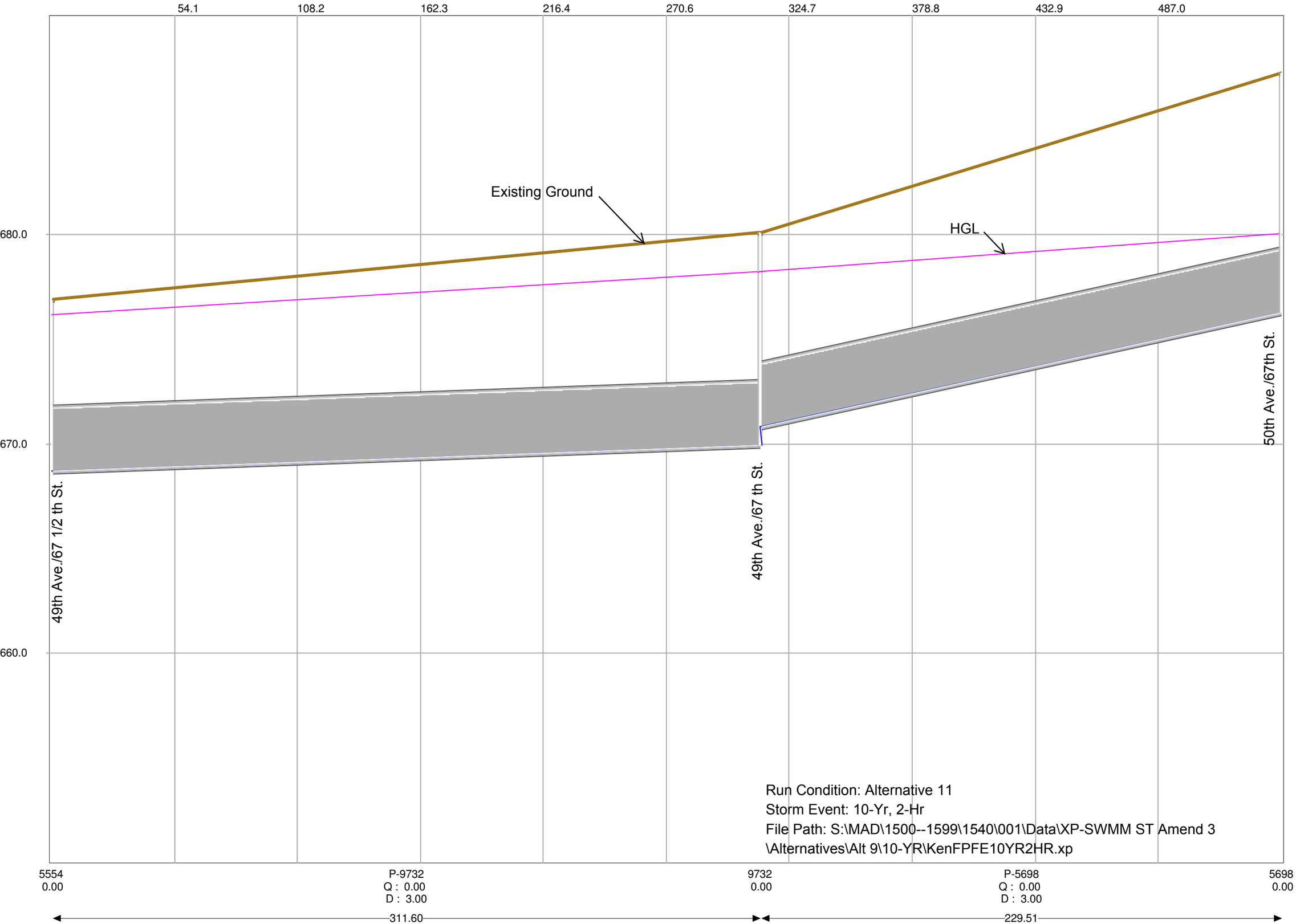
Untitled
Day [0] Time 00:01:00 Step 1

FPS P2



Untitled
Day [0] Time 00:01:00 Step 1

FPS P3



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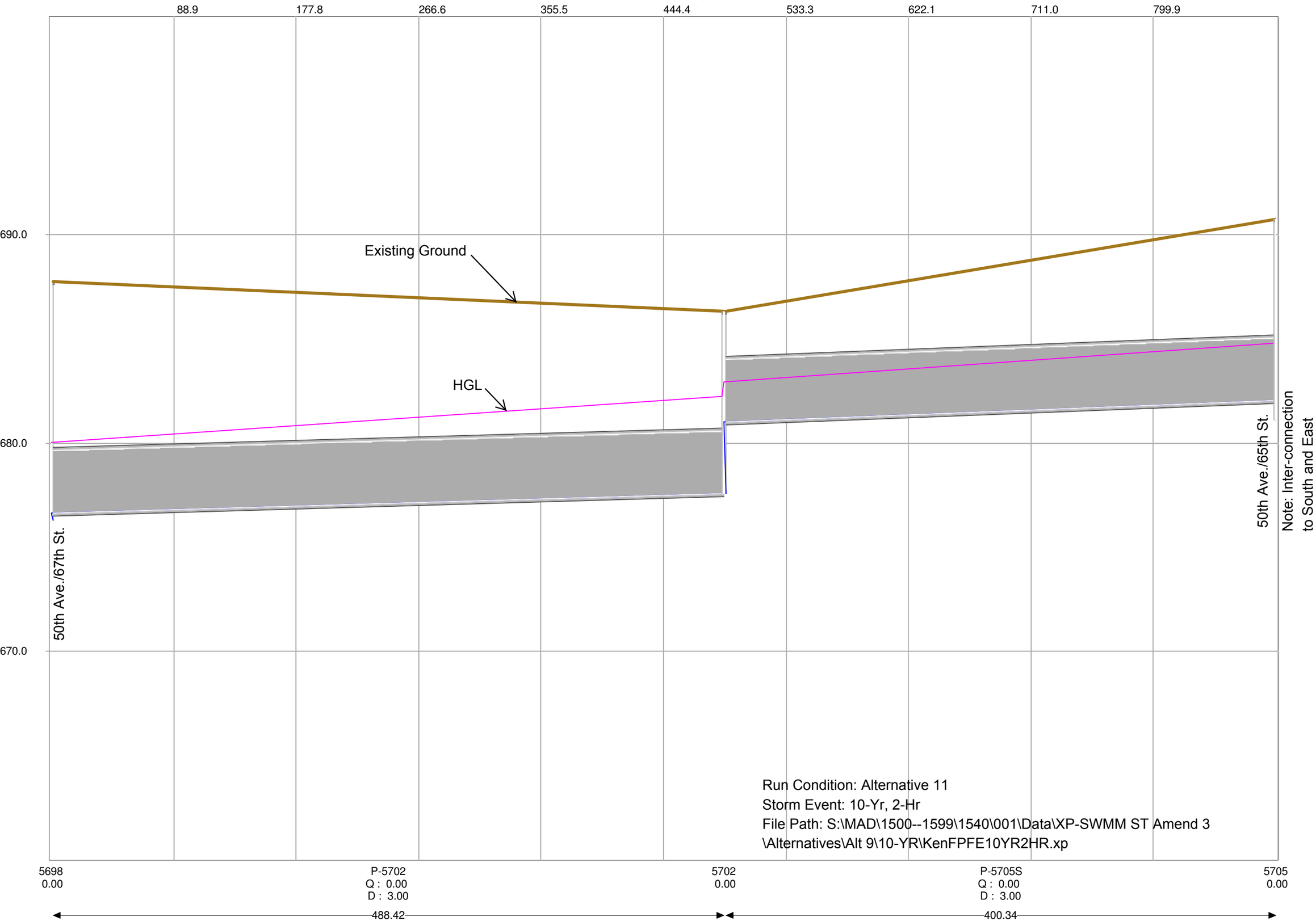
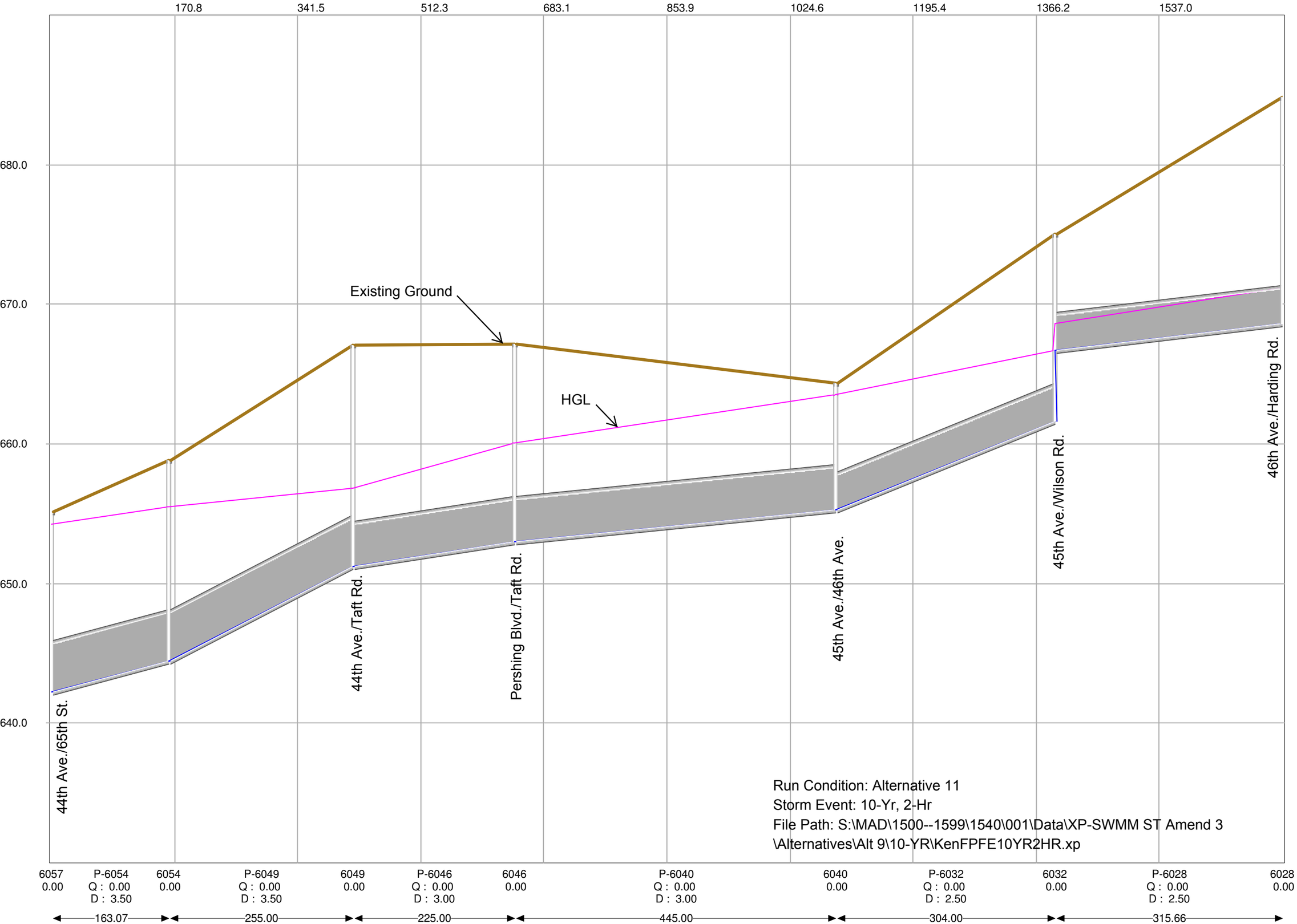
Day [0] Time 00:01:00 Step 1

FPS P4



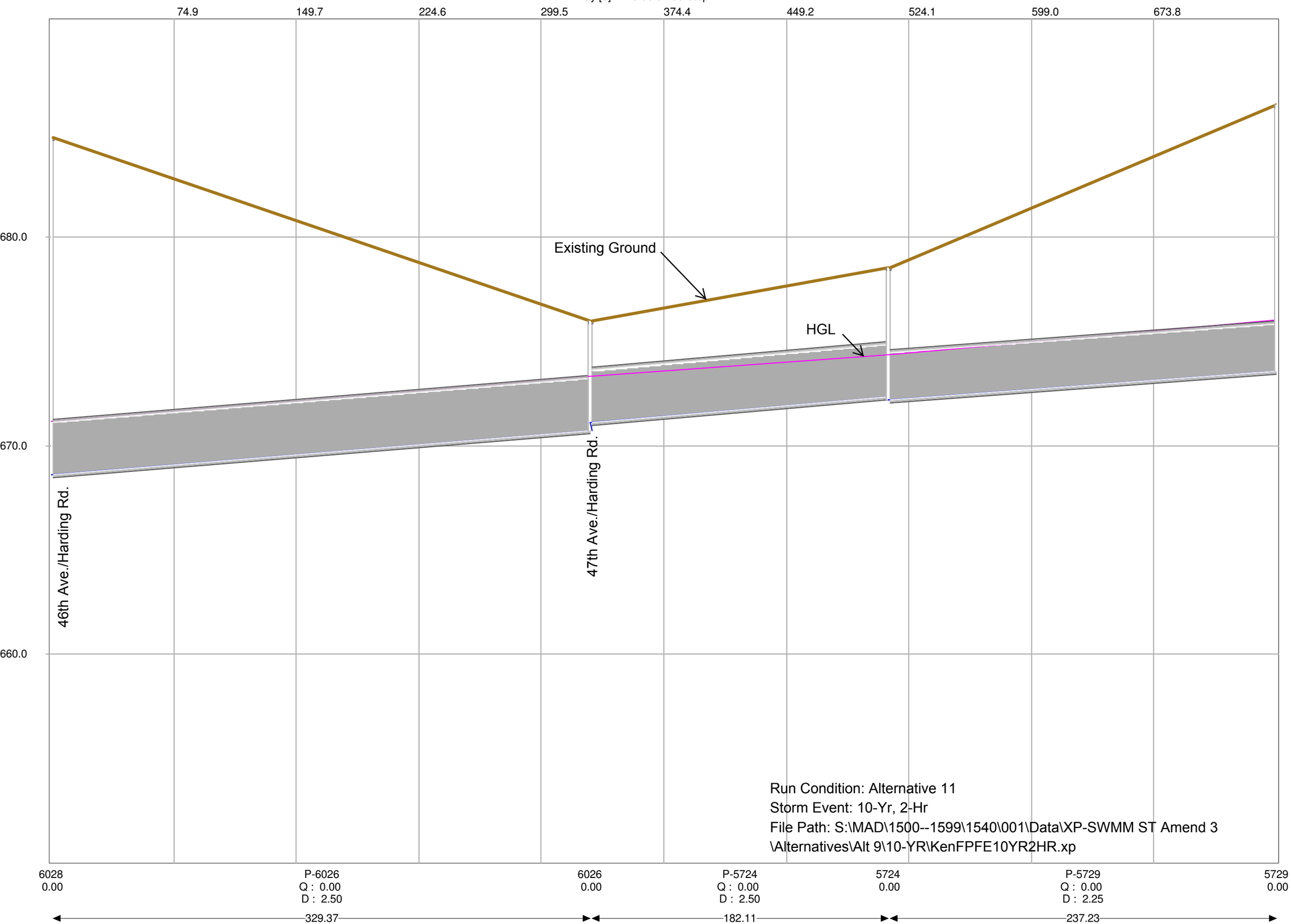
Untitled
Day [0] Time 00:01:00 Step 1

FPS P5



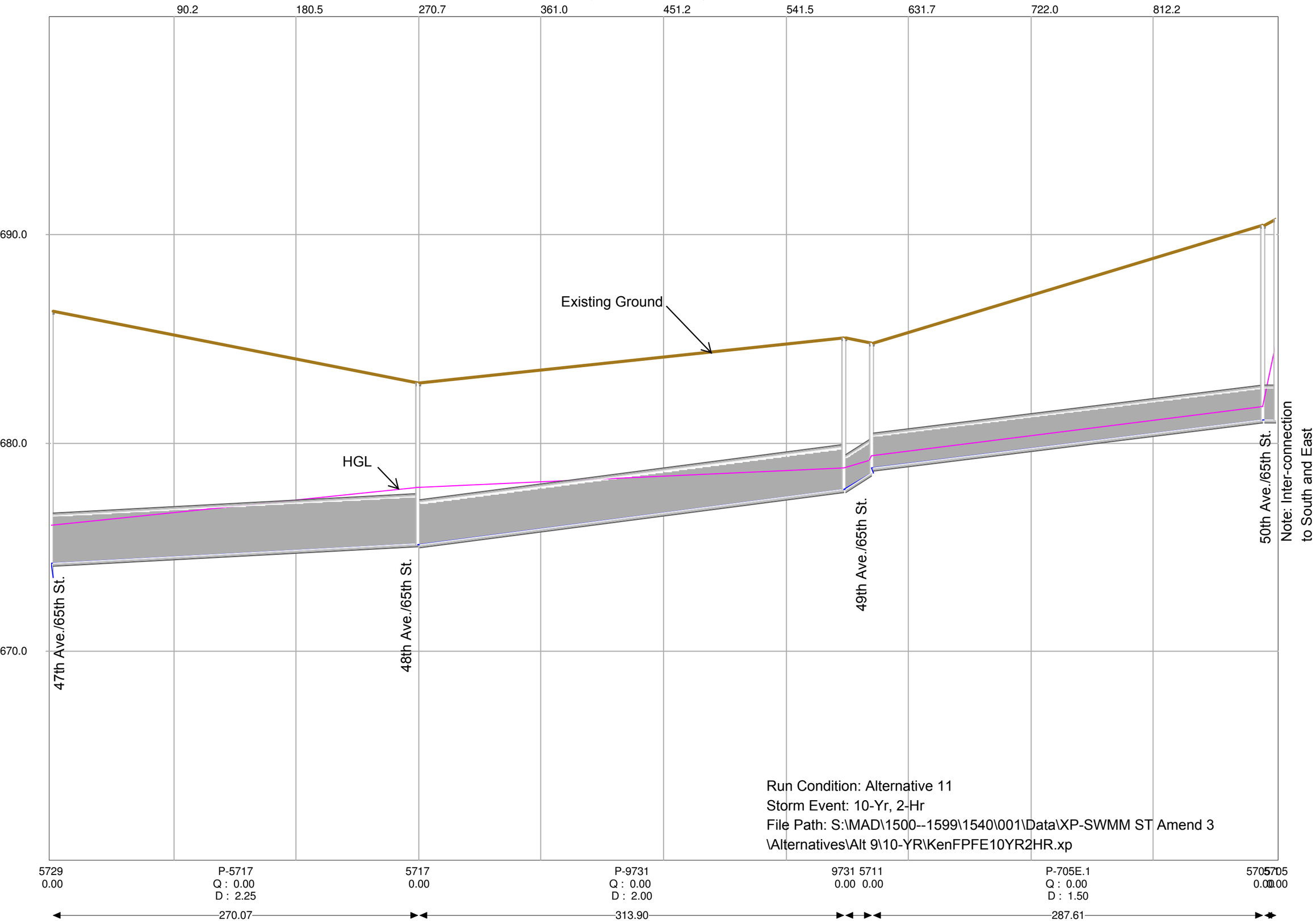
Untitled
Day [0] Time 00:01:00 Step 1

FPS P6



Untitled
Day [0] Time 00:01:00 Step 1

FPS P7



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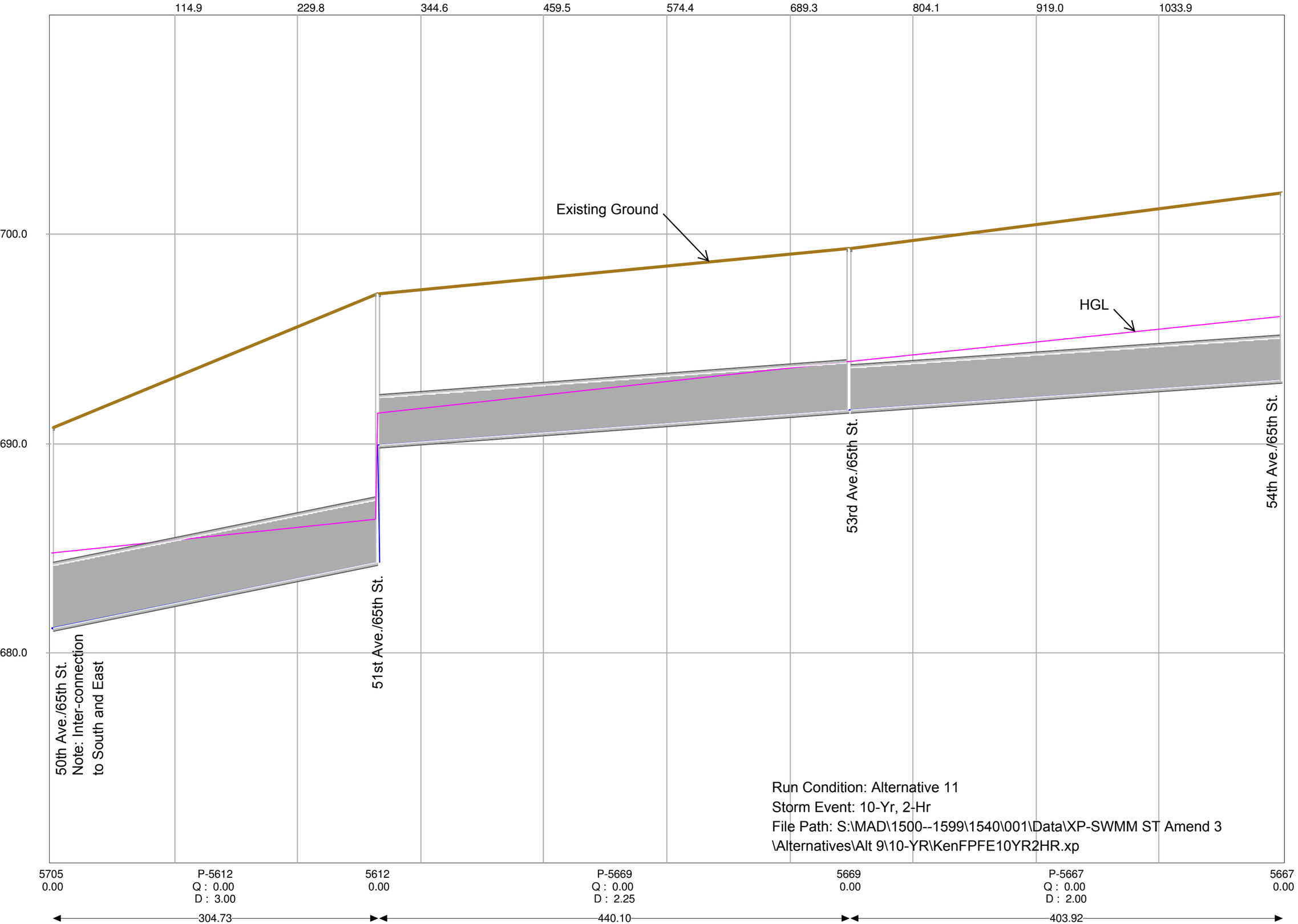
Day [0] Time 00:01:00 Step 1

FPS P8



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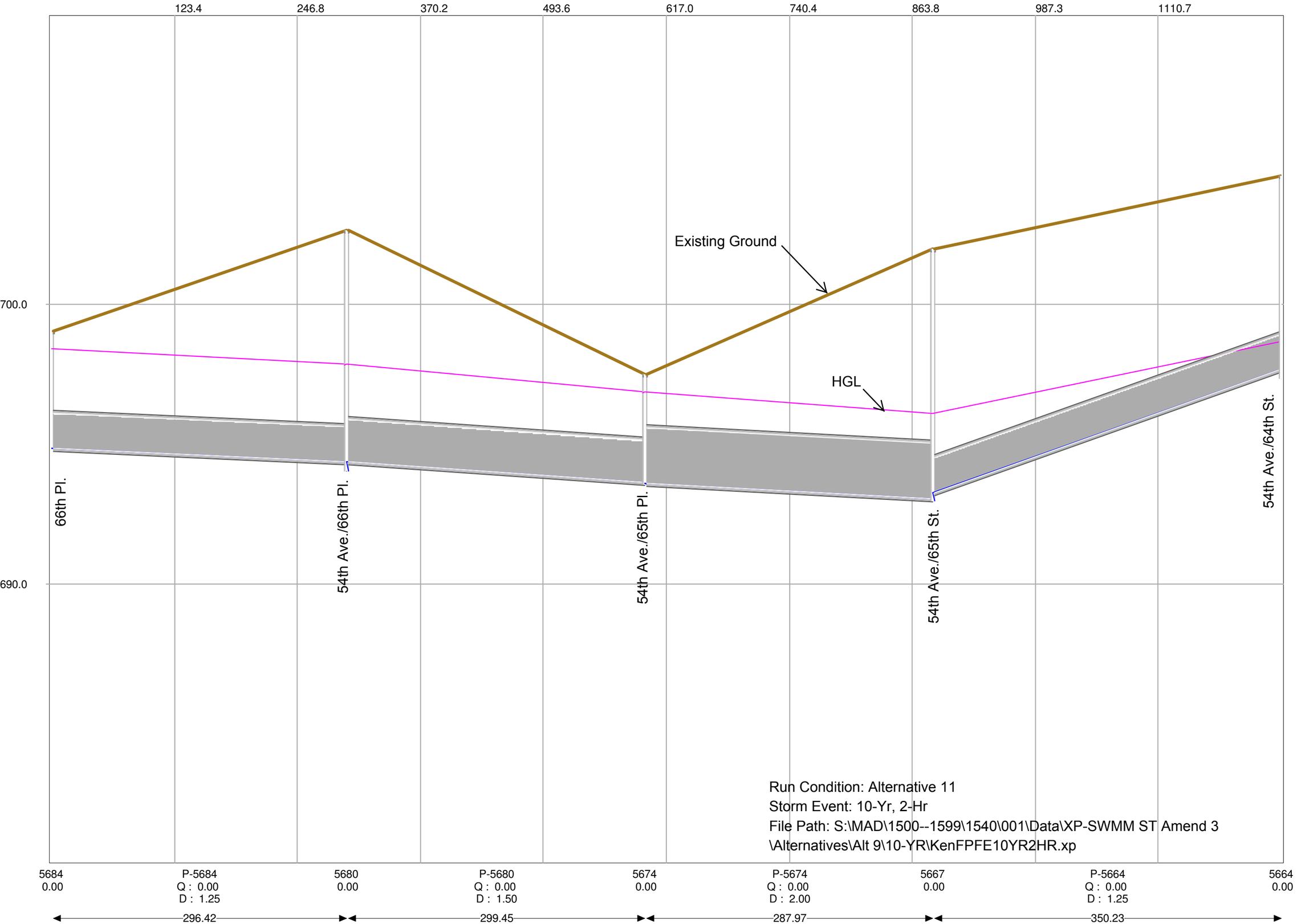
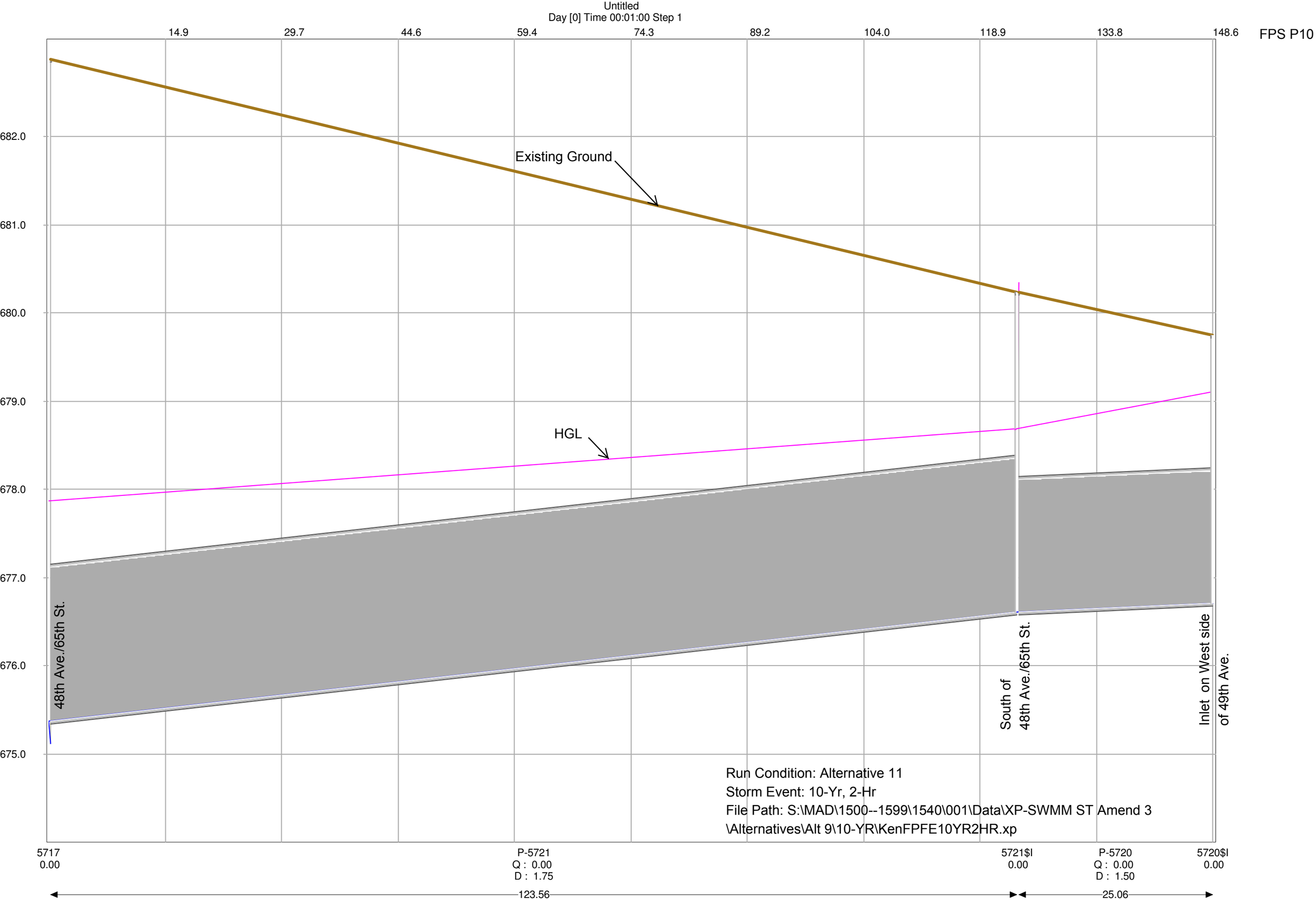
Day [0] Time 00:01:00 Step 1

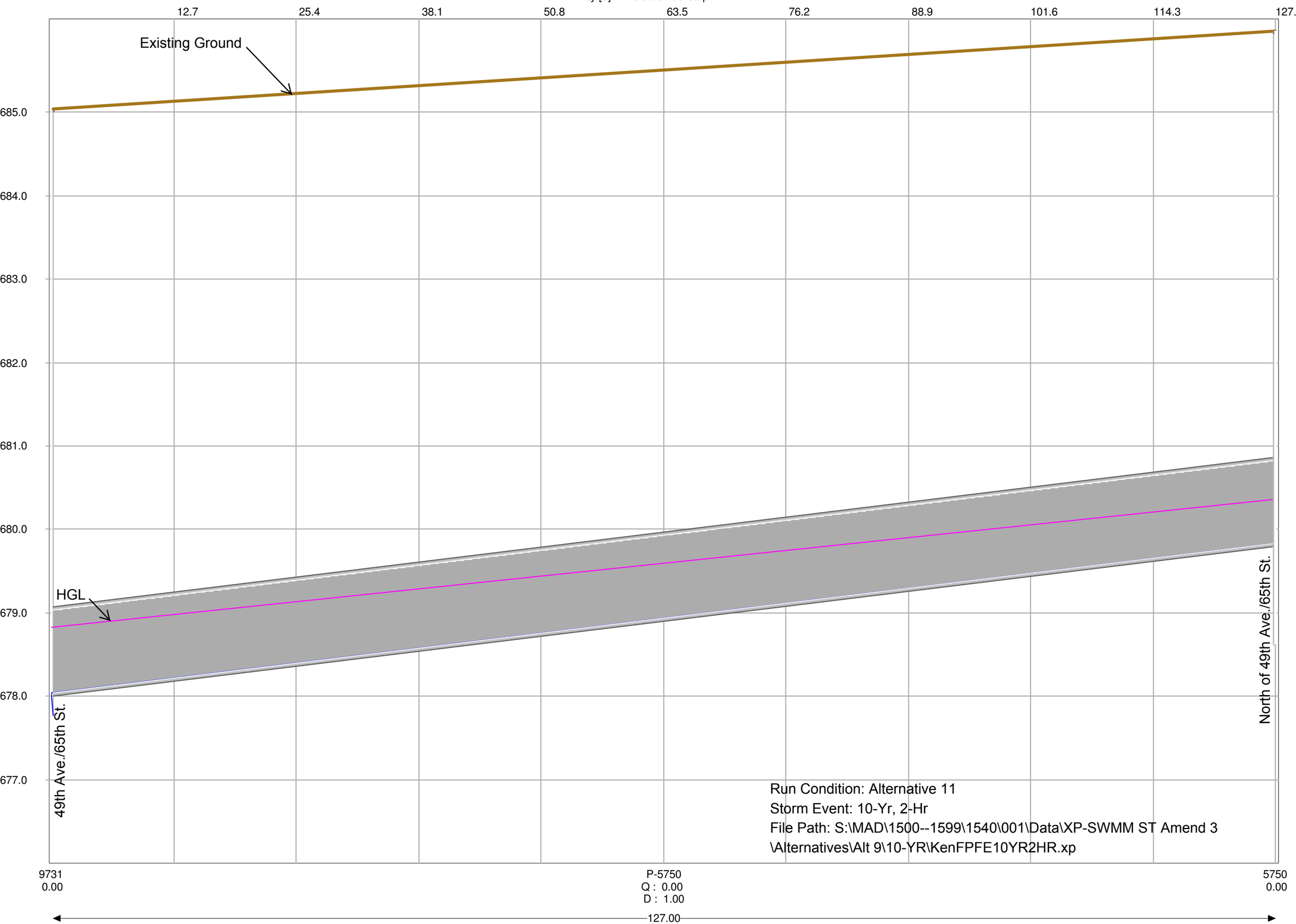
FPS P9




Untitled
Day [0] Time 00:01:00 Step 1
FPS P10
14.9
29.7
44.6
59.4
74.3
89.2
104.0
118.9
133.8
148.6
682.0
681.0
680.0
679.0
678.0
677.0
676.0
675.0
Existing Ground
HGL
48th Ave./65th St.
South of 48th Ave./65th St.
Inlet on West side of 49th Ave.
Run Condition: Alternative 11
Storm Event: 10-Yr, 2-Hr
File Path: S:\MAD\1500--1599\1540\001\Data\XP-SWMM ST Amend 3 \Alternatives\Alt 9\10-YR\KenFPFE10YR2HR.xp
5717
0.00
P-5721
Q : 0.00
D : 1.75
5721$I
0.00
P-5720
Q : 0.00
D : 1.50
5720$I
0.00
123.56
25.06

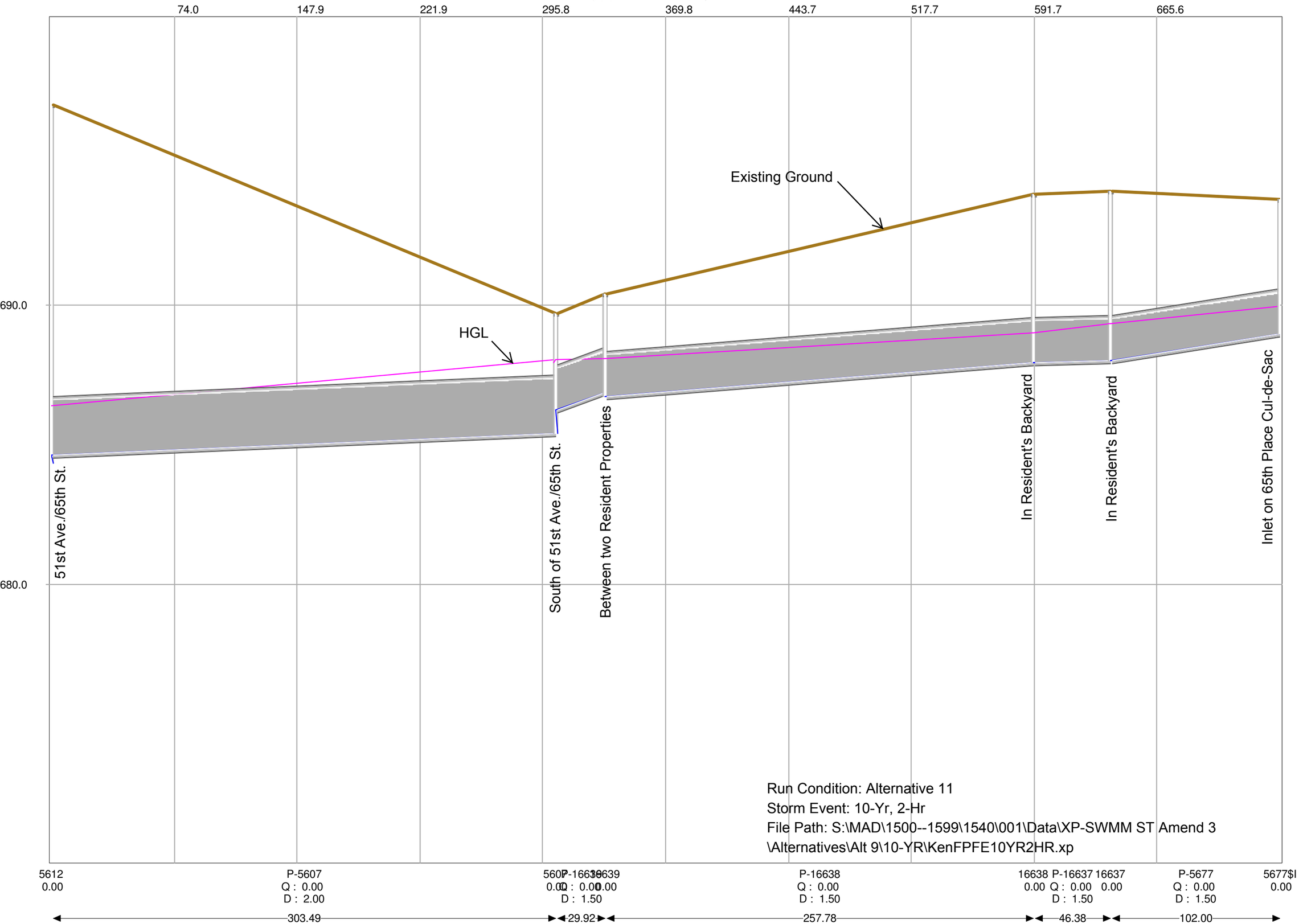
Untitled
Day [0] Time 00:01:00 Step 1

FPS P11



Untitled
Day [0] Time 00:01:00 Step 1

FPS P12



APPENDIX R
INLET CALCULATIONS: 10-YEAR STORM EVENT
(FOREST PARK NORTH AND SOUTH)

Legend

[1] Exported from XPSWMM Model (S:\MAD\1500--1599\1540\001\Data\XP-SWMM St\Flood Extents\10 YR\KenFPFE10YR2HR.xp)

[2] Intensity calculation uses equation found on 'IDF Curve' Sheet

[3] Rainfall depth (in) for 10 year 24 hour storm; found on Figure B-5 in TR-55

[4] Equations/methodology for Composite RCN to C conversion see 'JHL Example for RCN to C' Sheet

[4a] Rational C value calculated using FDM methodology

[5] Q=CIA

[6] Either On-Grade or Sag conditions for City standard inlet (R-3067-V)

[7] Chart from Neenah Foundry Web site see 'K-Chart for R-3067-V' Sheet for explanation and summary

[7a] Maximum transverse slope of 6% per Neenah Web site (If ST>6%, 6% was assumed in order to determine K-value)

[7b] Minimum longitudinal slope of 0.5% per Neenah Web site (If SL<0.5%, 0.5% was assumed in order to determine K-value)

[8] No greater than 3 inches (0.25 feet) of ponding allowed at the inlet

[9] Assume inlet clogging of 45% for on grade and 35% for sag conditions per FDM and Section 7.02.C.3. in Project Report

[10] For on grade conditions, Grate Capacity = K * (depth of flow)^(5/3), from Modified Manning Instructions on Neenah Web site. For sag conditions, Grate Capacity=2.4 cfs from weir flow calculator on Neenah Web site.

[11] Additional inlets are assumed to be a the same slope as the existing inlet and that all flow is being captured in the vicinity of the original inlet location and is not (overland) flowing to another set of inlets

[11a] **Cells need to be updated manually**. Additional inlet values were rounded up, except for those less than 0.1 (assume the inlet would be able to handle additional flow of 0.1 cfs or less)

[12] Orifice flow for R-2501:G (circular) inlet east of 65th Pl. cul-de-sac (FPS) and in Autobody Glass (FPN) and Funeral Home parking lots (FPN)

[13] If available inlet capacity is less than 1 cfs, it is assumed that a full upstream inlet would not be able to be eliminated.

[14] FPN54 inlets were changed to SAG condition to better represent actual field conditions

1540.001 - Kenosha - Forest Park North

Basin Label	Node (Structure ID)	[1]Area (ac)	[1]T_c (min)	[1]10-Yr, 2-Hr Max Flow from XPSWMM USED (cfs)	[6]Inlet Type	[7a]ST Transverse Slope of Road (%)	[7b]SL Longitudinal Slope (%)	[7]Grate Coefficient K	[8]Allowable h (ft)	[9]Clogging Factor (%)	[10]Grate Capacity-No Clogging Factor (cfs)	Grate Capacity With Clogging Factor USED (cfs)	[13]Available Capacity (XPSWMM Flows) (cfs)	Upstream Basin Label	Number of Inlets to Eliminate	Available Capacity Minus Bypass/Excess Flow (cfs)	Amount of Excess (XPSWMM) Flow (cfs)	[11]Exact Number of Additional Inlets for XPSWMM Max Flow	[11a]Rounded Number of Additional Inlets for XPSWMM Max Flow USED
FPN1	5820	0.114	9.92	0.165	ON-GRADE	1.5	0	15	0.25	45%	1.49	0.82	0.65	NO UPSTREAM NODE (FPN 2,4 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN2	5819	0.27	6.77	0.415	ON-GRADE	4.5	0.5	11.5	0.25	45%	1.14	0.63	0.21	NO UPSTREAM NODE (FPN 1, 3 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN3	5816	0.858	15.46	1.133	SAG	3	0.8	-	0.25	35%	2.40	1.56	0.43	NO UPSTREAM NODE (FPN 2,4 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN4	5817	0.266	10.9	0.373	SAG	3	0.7	-	0.25	35%	2.40	1.56	**1.19**	NO UPSTREAM NODE (FPN 1, 3 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN5	5803	0.113	5	0.318	ON-GRADE	1.5	3.9	27	0.25	45%	2.68	1.47	**1.16**	NO UPSTREAM NODE (FPN 6 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN6	5805	1.455	13.34	1.899	SAG	1.5	1.1	-	0.25	35%	2.40	1.56	-				0.34	0.22	1
FPN7	5806	1.188	15.43	1.224	SAG	7	1.65	-	0.25	35%	2.40	1.56	0.34	NO UPSTREAM NODE (FPN 6 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN8	5801	1.546	9.82	1.584	ON-GRADE	1.5	1.4	19	0.25	45%	1.89	1.04	-				0.55	0.53	1
FPN9	5790	0.427	9.3	0.433	ON-GRADE	3	1.2	16	0.25	45%	1.59	0.87	0.44	FPN 10	0		ALL FLOW CAPTURED	-	0
FPN10	5797	0.357	8.67	0.519	ON-GRADE	3	5.2	26.25	0.25	45%	2.60	1.43	0.91	FPN 11	0		ALL FLOW CAPTURED	-	0
FPN11	5734	0.171	5	0.257	ON-GRADE	3	0.9	14.75	0.25	45%	1.46	0.80	0.55	FPN 12	0		ALL FLOW CAPTURED	-	0
FPN12	5733	1.556	19.79	1.886	ON-GRADE	6	2	15.75	0.25	45%	1.56	0.86	-				1.03	1.19	2
FPN13	5736	0.837	11.66	1.171	ON-GRADE	6	3.7	19.5	0.25	45%	1.93	1.06	-				0.11	0.10	1
FPN14	5799	0.725	12.79	0.6	ON-GRADE	3	5.6	27.5	0.25	45%	2.73	1.50	0.90	NO UPSTREAM NODE (FPN 10 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN15	5789	2.695	25.33	1.374	SAG	7	1.8	-	0.25	35%	2.40	1.56	0.19	FPN 14	0		ALL FLOW CAPTURED	-	0
FPN16	5802	0.262	6.97	0.279	ON-GRADE	3	0.5	13.5	0.25	45%	1.34	0.74	0.46	NO UPSTREAM NODE (FPN 8 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN17	5796	0.069	8.3	0.058	ON-GRADE	4.5	4.3	22	0.25	45%	2.18	1.20	**1.14**	NO UPSTREAM NODE (FPN 22 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN18	5795	0.463	9.95	0.523	SAG	7	1.05	-	0.25	35%	2.40	1.56	**1.04**	NO UPSTREAM NODE (FPN 19 AT LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPN19	17546	0.19	16.6	0.19	SAG	7	1.05	-	0.25	35%	2.40	1.56	**1.37**	NO UPSTREAM NODE (FPN 18 AT LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPN20	5793	1.425	9.97	1.903	SAG	3	0.95	-	0.25	35%	2.40	1.56	-	NO UPSTREAM NODE (FPN 21 AT LOW POINT)			0.34	0.22	0
FPN21	17545	0.5	5.2	0.714	SAG	3	0.95	-	0.25	35%	2.40	1.56	**0.85**	FPN 20 (LOW POINT)	1	0.50	ALL FLOW CAPTURED	-	0
FPN22	5792	0.537	7.58	0.799	ON-GRADE	4.5	1.6	15.5	0.25	45%	1.54	0.85	0.05	FPN 23	0		ALL FLOW CAPTURED	-	0
FPN23	5784	0.19	7.03	0.289	SAG	1.5	3.35	-	0.25	35%	2.40	1.56	**1.27**	NO UPSTREAM NODE (FPN 26 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN24	5786	0.535	12.16	0.747	SAG	0.5	1.3	-	0.25	35%	2.40	1.56	0.81	NO UPSTREAM NODE (FPN 25 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN25	5787	2.613	12.06	3.633	SAG	1.5	1.3	-	0.25	35%	2.40	1.56	-				2.07	1.33	2
FPN26	5785	1.2	13.27	1.624	SAG	4.5	2.95	-	0.25	35%	2.40	1.56	-				0.06	0.04	0
FPN27	5781	2.265	7.14	1.736	ON-GRADE	3	1.9	18.5	0.25	45%	1.84	1.01	-				0.73	0.72	1
FPN28	5737	0.726	7.25	0.698	SAG	1.5	4.25	-	0.25	35%	2.40	1.56	0.86	NO UPSTREAM NODE (FPN 29, 30 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN29	5740	2.508	18.82	2.989	SAG	7	1	-	0.25	35%	2.40	1.56	-				1.43	0.92	1
FPN30	5739	2.582	15.68	3.386	SAG	3	1.2	-	0.25	35%	2.40	1.56	-				1.83	1.17	2
FPN31	5741	0.758	10.37	1.082	SAG	4.5	3.2	-	0.25	35%	2.40	1.56	0.48	NO UPSTREAM NODE (FPN 32 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN32	5742	1.999	12.81	2.627	SAG	0.5	1.95	-	0.25	35%	2.40	1.56	-				1.07	0.68	1
FPN33	5743	0.156	5	0.493	SAG	3	3.5	-	0.25	35%	2.40	1.56	**1.07**	NO UPSTREAM NODE (FPN 32 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN34	5748	0.19	9.91	0.275	ON-GRADE	7	1	12.25	0.25	45%	1.22	0.67	0.39	NO UPSTREAM NODE (FPN 35 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN35	5747	0.594	15.95	0.769	ON-GRADE	3	0.5	13.5	0.25	45%	1.34	0.74	-				0.03	0.04	0
FPN36	5746	0.16	5	0.427	ON-GRADE	7	1.2	12.5	0.25	45%	1.24	0.68	0.26	NO UPSTREAM NODE (FPN 35 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN37	5771	3.077	15.97	3.273	SAG	4.5	0.4	-	0.25	35%	2.40	1.56	-				1.71	1.10	1
FPN38	5772	1.373	10.41	0.983	SAG	1.5	2.35	-	0.25	35%	2.40	1.56	0.58	NO UPSTREAM NODE (FPN 37, 39 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN39	5769	3.458	11.27	4.479	SAG	7	0.8	-	0.25	35%	2.40	1.56	-				2.92	1.87	2
FPN40	5767	0.978	9.34	1.635	SAG	3	3.3	-	0.25	35%	2.40	1.56	-				0.08	0.05	0
FPN41	5766	1.832	10.42	2.709	SAG	1.5	0.1	-	0.25	35%	2.40	1.56	-				1.15	0.74	1
FPN42	5764	0.761	8.32	1.303	ON-GRADE	3	2.5	20.5	0.25	45%	2.03	1.12	-				0.18	0.16	1
FPN43	5763	0.878	7.96	1.502	ON-GRADE	3	2.9	21.5	0.25	45%	2.13	1.17	-				0.33	0.28	1
FPN44	5762	1.196	8.21	1.991	SAG	0.5	0	-	0.25	35%	2.40	1.56	-				0.43	0.28	1
FPN45	5760	1.443	10.76	1.591	SAG	0	0	-	0.25	35%	2.40	1.56	**1.53**	1 UPSTREAM NODE ACCOUNTED FOR (FPN 48 NEAR LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPN46	5759	0.396	11.48	0.431	SAG	0	0	-	0.25	35%	2.40	1.56	**1.13**	NO UPSTREAM NODE (FPN 47 NEAR LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPN47	5758	0.696	7.99	0.918	SAG	0	0	-	0.25	35%	2.40	1.56	0.64	NO UPSTREAM NODE (FPN 46 NEAR LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPN48	5756	1.945	13.36	2.414	SAG	0	0	-	0.25	35%	2.40	1.56	-				0.85	0.55	1
FPN49	5752	0.032	6.59	0.047	SAG	0	0	-	0.25	35%	2.40	1.56	**1.51**	NO UPSTREAM NODE (FPN 50 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN50	5755	0.381	12.59	0.519	SAG	0	0	-	0.25	35%	2.40	1.56	**1.04**	NO UPSTREAM NODE (FPN 49 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN51	5619	0.108	5	0.288	ON-GRADE	6	2.3	16.25	0.25	45%	1.61	0.89	0.60	NO UPSTREAM NODE (FPN 52 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN52	5618	0.521	10.92	0.729	ON-GRADE	3	6.4	30	0.25	45%	2.98	1.64	0.91	NO UPSTREAM NODE (FPN 55 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN53	5613	0.808	11.35	1.139	ON-GRADE	4.5	0.1	11.5	0.25	45%	1.14	0.63	-				0.51	0.82	1
[14]FPN54	5615	2.812	14.28	3.75	SAG	3	0.3	13.5	0.25	35%	2.40	1.56	-				2.19	1.40	2
FPN55	5621	1.052	16.69	1.406	ON-GRADE	4.5	2.5	18.25	0.25	45%	1.81	1.00	-				0.41	0.41	1
FPN56	5620	0.212	5	0.318	ON-GRADE	7	1.6	14.5	0.25	45%	1.44	0.79	0.47				ALL FLOW CAPTURED	-	0
FPN57	5657	0.992	11.19	0.955	SAG	4.5	1.1	-	0.25	35%	2.40	1.56	0.61	NO UPSTREAM NODE (FPN 58, 59 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN58	5659	1.63	21.05	1.943	SAG	3	3.3	-	0.25	35%	2.40	1.56	-				0.38	0.25	1
FPN59	5660	3.034	11.49	3.74	SAG	0.5	3.4	-	0.25	35%	2.40	1.56	-				2.18	1.40	2
FPN60	5655	0.499	6.97	0.71	ON-GRADE	7	1.8	15.25	0.25	45%	1.51	0.83	0.12	NO UPSTREAM NODE (FPN 61 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN61	5654	3.874	15.23	4.13	ON-GRADE	1.5	1.5	19.5	0.25	45%	1.93	1.06	-				3.07	2.88	3
FPN62	5652	1.691	8.18	2.038	ON-GRADE	3	0.2	13.5	0.25	45%	1.34	0.74	-				1.30	1.77	2
FPN63	5656	0.438	9.66	0.533	ON-GRADE	4.5	0.9	13	0.25	45%	1.29	0.71	0.18	NO UPSTREAM NODE (FPN 62 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN64	5650	7.072	21.4	6.495	SAG	4.5	4	-	0.25	35%	2.20	1.43	-				5.07	3.54	4
FPN65	5648	2.677	14.22	2.676	SAG	0.5	1.2	-	0.25	35%	2.40	1.56	-				1.12	0.72	1
FPN66	5651	0.428	8.02	0.479	SAG	3	1.3	-	0.25	35%	2.40	1.56	**1.08**	NO UPSTREAM NODE (FPN 65 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN67	5626	4.858	17.89	4.943	ON-GRADE	3	1.8	18	0.25	45%	1.79	0.98	-				3.96	4.03	4
FPN68	5625	0.803	6.99	0.932	ON-GRADE	3	1	15	0.25	45%	1.49	0.82	-				0.11	0.14	1
FPN69	5627	1.542	10.72	1.563	ON-GRADE	7	2.1	16	0.25	45%	1.59	0.87	-				0.69	0.79	1
FPN70	5633	3.519	18.5	2.701	SAG	3	1.3	-	0.25	35%	2.40	1.56	-				1.14	0.73	1
FPN71	5628	0.488	10.45	0.497	SAG	4.5	2.9	-	0.25	35%	2.40	1.56	**1.06**	NO UPSTREAM NODE (FPN 70 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN72	5629	0.493	14.33	0.656	SAG	0.5	1.8	-	0.25	35%	2.40	1.56	0.90	NO UPSTREAM NODE (FPN 71 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN73	5630	0.407	5	0.611	SAG	3	2	-	0.25	35%	2.40	1.56	0.95	FPN 74	0		ALL FLOW CAPTURED	-	0
FPN74	5637	0.404	9.05	0.789	ON-GRADE	1.5	3.6	26	0.25	45%	2.58	1.42	0.63	NO UPSTREAM NODE (FPN 75 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN75	5635	0.468	5	1.413	ON-GRADE	1.5	3.3	25	0.25	45%	2.48	1.36	-				0.05	0.04	0
FPN76	5631	0.67	10.34	1.254	SAG	4.5	3.3	-	0.25	35%	2.40	1.56	0.31	FPN 75	0		ALL FLOW CAPTURED	-	0
FPN77	5632	3.283	12.51	4.324	SAG	3	2.9	-	0.25	35%	2.40	1.56	-				2.76	1.77	2
FPN78	5638	0.896	9.14	1.151	ON-GRADE	1.5	2.3	22.5	0.25	45%	2.23	1.23	0.08	NO UPSTREAM NODE (FPN 79 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN79	5640	0.967	10.97	1.262	ON-GRADE	4.5	2.2	17.75	0.25	45%	1.76	0.97	-				0.29	0.30	1
[12]FPN80	3961	1.833	7.23	4.883	SAG	7	6	-	0.25	35%	2.20	1.43	-				3.45	2.41	3
[12]FPN81	3960	0.644	7.28	1.878	SAG	4.5	4.5	-	0.25	35%	2.20	1.43	-				0.45	0.31	1
[12]FPN82	8551	1.062	6.83	3.267	SAG	4.5	4.5	-	0.25	35%	2.20	1.43	-				1.84	1.28	2
[12]FPN83	8162	0.431	7.04	1.31	SAG	4.5	4.5	-	0.25	35%	2.20	1.43	0.12	NO UPSTREAM NODE (IN PARKING LOT)	0		ALL FLOW CAPTURED	-	0
FPN84	5777	0.444	6.79	0.68	ON-GRADE	0.5	5.5	34	0.25	45%	3.37	1.86	**1.18**	FPN 86	0		ALL FLOW CAPTURED	-	0
FPN85	5775	0.245	6.54	0.364	ON-GRADE	3	5.3	26.5	0.25	45%	2.63	1.45	**1.08**	FPN 87	1	0.99	ALL FLOW CAPTURED	-	0
FPN86	5778	0.324	8.4	0.472	ON-GRADE	1.5	0.2	15	0.25	45%	1.49	0.82	0.35	NO UPSTREAM NODE (FPN 86 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPN87	5779	0.562	8.03	0.83	ON-GRADE	3	0.2	13.5	0.25	45%	1.34	0.74	-				0.09	0.13	0
													Totals:		**2**			37.31	**53**

Basin Label	Node (Structure ID)	[1]Area (ac)	[1]T_c (min)	[1]10-Yr, 2-Hr Max Flow from XPSWMM USED (cfs)	[6]Inlet Type	ST Transverse Slope of Road (%)	SL Longitudinal Slope (%)	[7]Grate Coefficient K	[8]Allowable h (ft)	[9]Clogging Factor (%)	[10]Grate Capacity-No Clogging Factor (cfs)	Grate Capacity With Clogging Factor USED (cfs)	[13]Available Capacity (XPSWMM Flow) (cfs)	Upstream Basin Label	Number of Inlets to Eliminate	Available Capacity Minus Bypass/Excess Flow (cfs)	Amount of Excess (XPSWMM) Flow (cfs)	[11]Exact Number of Additional Inlets for XPSWMM Max Flow	[11a]Rounded Number of Additional Inlets for XPSWMM Max Flow USED
FPS1	6024	1.864	9.6	2.678	SAG	3	2.1	-	0.25	35%	2.40	1.56	-				1.12	0.72	1
FPS2	6025	0.614	13.36	0.833	SAG	1.5	2.1	-	0.25	35%	2.40	1.56	0.73	NO UPSTREAM NODE (FPS 1,3 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS3	6023	1.868	11.59	2.598	SAG	4.5	2.2	-	0.25	35%	2.40	1.56	-				1.04	0.67	1
FPS4	5722	0.427	8.71	0.621	ON-GRADE	1.5	3.6	26	0.25	45%	2.58	1.42	0.80	NO UPSTREAM NODE (FPS 5 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS5	5725	0.262	5.74	0.396	ON-GRADE	3	2.7	20.5	0.25	45%	2.03	1.12	0.72	FPS 6	0		ALL FLOW CAPTURED	-	0
FPS6	5726	0.136	5	0.301	ON-GRADE	3	2.5	20.25	0.25	45%	2.01	1.10	0.80	NO UPSTREAM NODE (FPS 7 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS7	5727	0.475	10.88	0.664	SAG	3	2.1	-	0.25	35%	2.40	1.56	0.90	NO UPSTREAM NODE (FPS 6 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS8	5728	0.273	10.67	0.389	ON-GRADE	4.5	2.3	17.75	0.25	45%	1.76	0.97	0.58	NO UPSTREAM NODE	0		ALL FLOW CAPTURED	-	0
FPS9	5719	0.109	5	0.346	ON-GRADE	3	0.8	14.25	0.25	45%	1.41	0.78	0.43	NO UPSTREAM NODE (FPS 12 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS10	5721	1.448	7.55	2.12	SAG	3	1.4	-	0.25	35%	2.40	1.56	-				0.56	0.36	1
FPS11	5720	2.241	11.22	3.14	SAG	3	1.7	-	0.25	35%	2.40	1.56	-				1.58	1.01	1
FPS12	5718	1.52	11.8	2.132	ON-GRADE	4.5	2.1	17.5	0.25	45%	1.74	0.95	-				1.18	1.23	2
FPS13	5715	2.37	15.63	3.11	SAG	3	1.3	-	0.25	35%	2.40	1.56	-				1.55	0.99	1
FPS14	5716	0.09	5	0.286	ON-GRADE	4.5	0.8	12.75	0.25	45%	1.26	0.70	0.41	FPS 15	0		ALL FLOW CAPTURED	-	0
FPS15	5714	0.638	10.86	0.893	SAG	1.5	1.75	-	0.25	35%	2.40	1.56	0.67	FPS 20	0		ALL FLOW CAPTURED	-	0
FPS16	5713	0.093	5	0.14	SAG	1.5	1	-	0.25	35%	2.40	1.56	**1.42**	FPS 17	1	1.27	ALL FLOW CAPTURED	-	0
FPS17	5751	0.913	10.15	1.321	ON-GRADE	1.5	2	21.5	0.25	45%	2.13	1.17	-				0.15	0.13	0
FPS18	5749	0.586	11.46	0.819	ON-GRADE	3	1.6	17.5	0.25	45%	1.74	0.95	0.14	NO UPSTREAM NODE (FPS 17 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS19	5712	2.697	16.22	3.501	SAG	7	1.4	-	0.25	35%	2.40	1.56	-				1.94	1.24	2
FPS20	5710	0.142	5	0.451	SAG	4.5	2	-	0.25	35%	2.40	1.56	**1.11**	FPS 25	0		ALL FLOW CAPTURED	-	0
FPS21	5706	1.059	6.38	1.577	ON-GRADE	1.5	0.4	15	0.25	45%	1.49	0.82	-				0.76	0.93	0
FPS22	5707	2.864	7.85	4.259	SAG	0.5	1.2	-	0.25	35%	2.40	1.56	-				2.70	1.73	2
FPS23	5708	0.378	6.7	0.568	ON-GRADE	3	4.2	25	0.25	45%	2.48	1.36	**0.80**	FPS 21	1	0.04	ALL FLOW CAPTURED	-	0
FPS24	5704	0.321	5	0.482	ON-GRADE	3	1.8	18	0.25	45%	1.79	0.98	0.50	FPS 32	0		ALL FLOW CAPTURED	-	0
FPS25	5709	0.068	5	0.102	ON-GRADE	3	2.8	21.25	0.25	45%	2.11	1.16	**1.06**	NO UPSTREAM NODE (FPS 23 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS26	5701	0.975	9.76	1.184	SAG	4.5	0.5	-	0.25	35%	2.40	1.56	0.38	NO UPSTREAM NODE (FPS 27 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS27	5703	3.444	14.41	3.874	SAG	3	0.25	-	0.25	35%	2.40	1.56	-				0.75	0.24	1
FPS28	5606	0.547	5	0.792	SAG	4.5	0.6	-	0.25	35%	2.40	1.56	0.77	NO UPSTREAM NODE (FPS 29 NEAR LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPS29	9733	0.541	5	0.675	SAG	4.5	1.1	-	0.25	35%	2.40	1.56	0.89	NO UPSTREAM NODE (FPS 28 NEAR LOW POINT)	0		ALL FLOW CAPTURED	-	0
FPS30	5609	3.514	23.63	3.536	SAG	4.5	1.5	-	0.25	35%	2.40	1.56	-				1.98	1.27	2
~~FPS31~~	~~5608~~	~~2.675~~	~~16.05~~	~~3.299~~	~~SAG~~	~~4.5~~	~~1.7~~	~~-~~	~~0.25~~	~~35%~~	~~2.40~~	~~1.56~~	~~-~~				~~1.74~~	~~1.11~~	~~2~~
FPS31	5608	1.87	15	2.2819	SAG	-	-	-	0.25	35%	2.40	1.56					0.72	0.46	1
[12]FPS31A	16639	0.8	15.8	0.99	SAG	-	-	-	0.25	35%	2.20	1.43					ALL FLOW CAPTURED	-	0
FPS32	5611	0.29	11.56	0.421	ON-GRADE	3	0.8	14.25	0.25	45%	1.41	0.78	0.36	FPS 36	0		ALL FLOW CAPTURED	-	0
FPS33	5610	1.106	11.28	1.564	ON-GRADE	1.5	1.2	17.75	0.25	45%	1.76	0.97	-				0.60	0.61	1
FPS34	5671	0.478	8.21	0.699	ON-GRADE	1.5	1.2	17.75	0.25	45%	1.76	0.97	0.27	NO UPSTREAM NODE (FPS 35 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS35	5672	2.394	21.31	2.834	ON-GRADE	1.5	0.9	16.5	0.25	45%	1.64	0.90	-				1.93	2.15	3
FPS36	5670	0.465	11.37	0.654	SAG	3	0.65	-	0.25	35%	2.40	1.56	0.91	NO UPSTREAM NODE (FPS 34, 35 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS37	5678	2.068	15.27	2.731	SAG	1.5	0.8	-	0.25	35%	2.40	1.56	-				1.17	0.75	1
FPS38	5677	2.219	17.03	2.014	SAG	1.5	2.1	-	0.25	35%	2.40	1.56	-				0.45	0.29	1
FPS39	5683	0.642	9.8	0.75	SAG	1.5	0.6	-	0.25	35%	2.40	1.56	0.81	NO UPSTREAM NODE (FPS 40 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS40	5682	1.73	9.95	2.038	SAG	3	0.65	-	0.25	35%	2.40	1.56	-				0.48	0.31	1
FPS41	5681	0.984	10.61	1.773	ON-GRADE	1.5	0.6	15.25	0.25	45%	1.51	0.83	-				0.94	1.13	2
FPS42	5679	0.492	10.97	0.995	ON-GRADE	1.5	1.2	17.75	0.25	45%	1.76	0.97	-				0.03	0.03	0
FPS43	5675	0.371	11.07	0.429	ON-GRADE	4.5	0.4	11	0.25	45%	1.09	0.60	0.17	NO UPSTREAM NODE (FPS 44 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS44	5676	0.497	11.36	0.7	ON-GRADE	3	0.5	13.5	0.25	45%	1.34	0.74	0.04	NO UPSTREAM NODE (FPS 43 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS45	5673	4.54	19.9	5.32	SAG	3	0.5	-	0.25	35%	2.40	1.56	-				3.76	2.41	3
FPS46	5666	0.11	5	0.349	SAG	0.5	2.9	-	0.25	35%	2.40	1.56	**1.21**	NO UPSTREAM NODE (FPS 47 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS47	5665	0.85	15.2	1.119	SAG	3	0.7	-	0.25	35%	2.40	1.56	0.44	NO UPSTREAM NODE (FPS 46 ACROSS ROAD)	0		ALL FLOW CAPTURED	-	0
FPS48	5668	0.603	12.98	0.816	SAG	1.5	0.6	-	0.25	35%	2.40	1.56	0.74	NO UPSTREAM NODE	0		ALL FLOW CAPTURED	-	0
FPS49	5663	2.712	14.29	3.473	ON-GRADE	1.5	0.5	15	0.25	45%	1.49	0.82	-				2.65	3.24	4
FPS50	5662	1.07	14.4	1.309	ON-GRADE	3	0.6	13.75	0.25	45%	1.36	0.75	-				0.56	0.74	1
													Totals:		**2**			23.76	**34**

APPENDIX S
INLET LEAD CALCULATIONS: 10-YEAR STORM EVENT
(FOREST PARK NORTH AND SOUTH)

Legend

[1] Exported from XPSWMM Model (S:\MAD\1500--1599\1540\001\Data\XP-SWMM St\Flood Extents\10 YR\KenFPFE10YR2HR.xp)

[2] Inlets to be added are noted in **bold**, inlets with existing R-3067V castings are noted in **bold**

[3] Pipes with negative slope were revised so that slope was essentially flat (**0.005**) and included for replacement

[4] Calculated using Manning's Equation: $Q=(1.49/n)*(A^{5/3}*S^{1/2})/P^{2/3}$

[4a] Calculated using Manning's Equation: $Q=(1.49/n)*(A^{5/3}*S^{1/2})/P^{2/3}$

[5] Pipe length reported is for pipe leaving the respective structure, assumed to be 5' pipe length (sag)/10' pipe length (on-grade) between additional inlets and measured from center of structure to center of structure

[6] Calculated required diameter using Flowmaster, input required capacity, Manning Coefficent and slope

[7] Minimum pipe size used = 12", sizes noted in ***bold*** were enlarged in order to avoid downsizing of consecutive pipe segments

[8] Looking at the contours it appears an additional manhole needs to be added to accept flow from additional inlets placed

[9] In cases where the required piping was greater than 1' diameter, the flow was adjusted so that the inlet lead piping would 'telescope' back (reduce pipe size as moving upstream, since all flow would not be seen by one inlet and would be governed by inlet capacity)

[10] Value from Inlet Calculations (August 2010).xlxs, Assume additional inlets have same characteristics as existing inlet, Cumulative inlet capacities will not add up exactly to Max Flow values due to rounding

[12] R-2501:G (circular) inlet in Autobody Glass and Funeral Home parking lots

Basin Label	[2]Node (Structure ID)	Inlet Type	[1]Mainline Manhole for Inlet(s) Discharge	[1]10-Yr, 2-Hr Required Capacity (Max Flow from XPSWMM) (cfs)	[11a]Rounded Number of Additional Inlets for XPSWMM Max Flow USED	[1,3]Existing Inlet Lead Slope (ft/ft)	[1]Existing Inlet Lead Diameter (ft)	[1]Manning Coefficient	Pipe Type	[4]Existing Inlet Lead Capacity (cfs)	Existing Inlet Lead Capacity Sufficient	[1]Existing Inlet Lead Length (ft)	USED Inlet Lead Slope (ft/ft)	USED Assumed Manning Coefficient for Concrete Pipe	[10]Grate Capacity With Clogging Factor (cfs)	USED [9]Required Pipe Capacity (cfs)	[6]Minimum Required Inlet Lead Diameter (ft)	USED [7]Required Inlet Lead Diameter (ft)	USED [4a]Inlet Lead Capacity (cfs)	[5]Additional Inlet Lead Piping (ft)	Box Inlet (Additional)	R-3067:V Casting (Additional)	Box Inlet (Rebuilt)	R-3067:V Casting (Rebuilt)	R-2501: G Casting
FPN1	5820	ON-GRADE	5818	0.165	0	0.005	0.50	0.017	CLAY	0.30	YES	50													
FPN2	5819	ON-GRADE	5818	0.415	0	0.005	0.83	0.026	CMP	0.78	YES	41													
FPN3	5816	SAG	5818	1.133	0	0.007	0.50	0.017	CLAY	0.35	NO	16	0.007	0.013	1.56	1.13	0.7	1	2.92	16			1	1	
FPN4	5817	SAG	5818	0.373	0	0.004	0.50	0.017	CLAY	0.27	NO	30	0.004	0.013	1.56	0.37	0.51	1	2.26	30			1	1	
FPN5	5803	ON-GRADE	5804	0.318	0	0.028	0.67	0.026	CMP	1.02	YES	35													
FPN6	5805	SAG	5804	1.899	1	0.057	0.67	0.026	CMP	1.45	NO	24	0.057	0.013	1.56	1.90	0.57	1	8.54	24			1	1	
FPN6	**5805A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN7	5806	SAG	5804	1.224	0	0.047	0.67	0.026	CMP	1.32	YES	59													
FPN8	5801	ON-GRADE	5800	1.584	1	0.033	0.67	0.028	CMP	1.02	NO	9	0.033	0.013	1.04	1.58	0.59	1	6.44	9			1	1	
FPN8	**5801A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.04	1.04	0.72	1	2.53	10	1	1			
FPN9	5790	ON-GRADE	5791	0.433	0	0.047	0.67	0.017	CLAY	2.00	YES	30													
FPN10	5797	ON-GRADE	5798	0.519	0	0.035	0.67	0.009	PVC	3.26	YES	22													
FPN11	5734	ON-GRADE	5735	0.257	0	0.013	0.83	0.009	PVC	3.59	YES	42													
FPN12	5733	ON-GRADE	5735	1.886	2	0.028	0.67	0.017	CLAY	1.55	NO	41	0.028	0.013	0.86	1.89	0.65	1	5.96	41			1	1	
FPN12	**5733A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.86	1.72	0.87	1	2.53	10	1	1			
FPN12	**5733B**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.86	0.86	0.67	1	2.53	10	1	1			
FPN13	5736	ON-GRADE	5735	1.171	1	0.010	0.67	0.026	CMP	0.61	NO	36	0.010	0.013	1.06	1.17	0.66	1	3.57	36			1	1	
FPN13	**5736A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.06	1.06	0.72	1	2.53	10	1	1			
FPN14	5799	ON-GRADE	5798	0.6	0	0.024	0.67	0.009	PVC	2.73	YES	16													
FPN15	5789	SAG	300	1.374	0	0.289	1.00	0.017	CLAY	14.68	YES	14												REUSE	
FPN16	5802	ON-GRADE	5800	0.279	0	0.026	0.67	0.026	CMP	0.98	YES	30													
FPN17	5796	ON-GRADE	200	0.058	0	0.075	0.67	0.017	CLAY	2.53	YES	50													
FPN18	5795	SAG	5794	0.523	0	0.004	1.00	0.014	CONCRETE	2.13	YES	22													
FPN19	17546	SAG	5795	0.19	0	0.053	1.00	0.014	CONCRETE	7.63	YES	6												REUSE	
FPN20	5793	SAG	5794	1.903	0	0.022	1.00	0.014	CONCRETE	4.90	YES	14													
FPN21	17545	SAG	5793	0.714	0	0.046	1.00	0.014	CONCRETE	7.10	YES	7												REUSE	
FPN22	5792	ON-GRADE	17547	0.799	0	0.015	1.00	0.009	PVC	6.32	YES	43													
FPN23	5784	SAG	5782	0.289	0	0.014	0.67	0.017	CLAY	1.08	YES	45													
FPN24	5786	SAG	5788	0.747	0	0.022	0.67	0.017	CLAY	1.39	YES	25													
FPN25	5787	SAG	5788	3.633	2	0.026	0.83	0.009	PVC	5.08	YES	13	0.026	0.013	1.56	3.63	0.84	1	5.73	13			1	1	
FPN25	**5787A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN25	**5787B**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN26	5785	SAG	5782	1.624	0	0.070	0.34	0.017	CLAY	0.40	NO	20	0.070	0.013	1.56	1.62	0.52	1	9.44	20			1	1	
FPN27	5781	ON-GRADE	5782	1.736	1	0.066	0.67	0.026	CMP	1.56	NO	28	0.066	0.013	1.01	1.74	0.54	1	9.20	28			1	1	
FPN27	**5781A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.01	1.01	0.71	1	2.53	10	1	1			
FPN28	5737	SAG	5738	0.698	0	0.102	0.83	0.009	PVC	10.11	YES	17													
FPN29	5740	SAG	5738	2.989	1	0.062	0.83	0.009	PVC	7.91	YES	48	0.062	0.013	1.56	2.99	0.67	1	8.92	48			1	1	
FPN29	**5740A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN30	5739	SAG	5738	3.386	2	0.028	0.67	0.017	CLAY	1.56	NO	35	0.028	0.013	1.56	3.39	***0.81***	***1.25***	10.88	35			1	1	
FPN30	**5739A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5	1	1			
FPN30	**5739B**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN31	5741	SAG	5744	1.082	0	0.016	0.67	0.026	CMP	0.77	NO	35	0.016	0.013	1.56	1.08	0.59	1	4.56	35			1	1	
FPN32	5742	SAG	5744	2.627	1	0.043	0.67	0.028	CMP	1.16	NO	38	0.043	0.013	1.56	2.63	0.68	1	7.38	38			1	1	
FPN32	**5742A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN33	5743	SAG	5744	0.493	0	0.010	0.67	0.026	CMP	0.62	YES	16													
FPN34	5748	ON-GRADE	9736	0.275	0	0.039	0.67	0.017	CLAY	1.82	YES	64													
FPN35	5747	ON-GRADE	9736	0.769	0	0.037	0.67	0.017	CLAY	1.78	YES	70													
FPN36	5746	ON-GRADE	9736	0.427	0	0.032	0.67	0.026	CMP	1.09	YES	42													
FPN37	5771	SAG	5770	3.273	1	0.042	0.67	0.026	CMP	1.25	NO	20	0.042	0.013	1.56	3.27	0.74	1	7.34	20			1	1	
FPN37	**5771A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN38	5772	SAG	5770	0.983	0	0.014	0.67	0.017	CLAY	1.10	YES	72													
FPN39	5769	SAG	5770	4.479	2	0.038	0.67	0.017	CLAY	1.82	NO	28	0.038	0.013	1.56	4.48	***0.85***	***1.25***	12.69	28			1	1	
FPN39	**5769A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5	1	1			
FPN39	**5769B**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN40	5767	SAG	5768	1.635	0	0.073	0.67	0.017	CLAY	2.51	YES	15													
FPN41	5766	SAG	5770	2.709	1	0.024	0.67	0.017	CLAY	1.43	NO	61	0.024	0.013	1.56	2.71	0.77	1	5.51	61			1	1	
FPN41	**5766A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN42	5764	ON-GRADE	5765	1.303	1	0.021	1.00	0.014	CONCRETE	4.80	YES	36	DO NOT REPLACE - 2009 CONSTRUCTION											REUSE	
FPN42	**5764A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.12	1.12	0.74	1	2.53	10	1	1			
FPN43	5763	ON-GRADE	5764	1.502	1	0.020	1.00	0.014	CONCRETE	4.69	YES	25	DO NOT REPLACE - 2009 CONSTRUCTION											REUSE	
FPN43	**5763A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.17	1.17	0.75	1	2.53	10	1	1			
FPN44	5762	SAG	8054	1.991	1	0.020	1.00	0.014	CONCRETE	4.69	YES	34	DO NOT REPLACE - 2009 CONSTRUCTION												
FPN44	**5762A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN45	5760	SAG	5761	1.591	0	0.020	1.00	0.014	CONCRETE	4.72	YES	10													
FPN46	5759	SAG	5761	0.431	0	0.020	1.00	0.014	CONCRETE	4.65	YES	18													
FPN47	5758	SAG	5757	0.918	0	0.020	1.00	0.014	CONCRETE	4.66	YES	20													
FPN48	5756	SAG	5757	2.414	1	0.021	1.00	0.014	CONCRETE	4.75	YES	11	DO NOT REPLACE - 2009 CONSTRUCTION												
FPN48	**5756A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN49	5752	SAG	5754	0.047	0	0.020	1.00	0.014	CONCRETE	4.68	YES	29													
FPN50	5755	SAG	5754	0.519	0	0.020	1.00	0.014	CONCRETE	4.70	YES	25													
FPN51	5619	ON-GRADE	5622	0.288	0	0.022	1.00	0.026	CMP	2.67	YES	48													
FPN52	5618	ON-GRADE	5622	0.729	0	0.029	0.67	0.029	CMP	0.93	YES	39													
FPN53	5613	ON-GRADE	5614	1.139	1	0.026	0.67	0.026	CMP	0.98	NO	26	0.026	0.013	0.63	1.14	0.55	1	5.78	26			1	1	
FPN53	**5613A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.63	0.63	0.59	1	2.53	10	1	1			
FPN54	5615	SAG	5614	3.75	4	0.029	0.67	0.029	CMP	0.92	NO	14	0.029	0.013	1.56	3.75	0.83	1	6.06	14			1	1	
FPN54	**5615A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN54	**5615B**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN55	5621	ON-GRADE	5622	1.406	1	0.049	0.67	0.026	CMP	1.34	NO	34	0.049	0.013	1.00	1.41	0.52	1	7.90	34			1	1	
FPN55	**5621A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.00	1.00	0.71	1	2.53	10	1	1			
FPN56	5620	ON-GRADE	5622	0.318	0	0.031	1.00	0.026	CMP	3.16	YES	37													
FPN57	5657	SAG	5661	0.955	0	0.010	0.83	0.026	CMP	1.10	YES	18													
FPN58	5659	SAG	5658	1.943	1	0.015	0.83	0.026	CMP	1.32	NO	32	0.015	0.013	1.56	1.56	0.68	1	4.30	32			1	1	
FPN58	**5658A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	20	1	1			
FPN59	5660	SAG	5661	3.74	2	0.019	0.83	0.026	CMP	1.52	NO	31	0.019	0.013	1.56	3.74	***0.9***	***1.25***	9.00	31			1	1	
FPN59	**5660A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5	1	1			
FPN59	**5660B**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN60	5655	ON-GRADE	5653	0.71	0	0.034	0.83	0.026	CMP	2.02	YES	39													
FPN61	5654	ON-GRADE	5653	4.13	3	0.032	0.83	0.029	CMP	1.77	NO	32	0.032	0.013	1.06	4.13	0.85	1	6.44	32			1	1	
FPN61	**5654A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.06	1.06	0.72	1	2.53	10	1	1			
FPN61	**5654B**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.06	2.13	0.94	1	2.53	28	1	1			
FPN61	**5654C**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	1.06	1.06	0.72	1	2.53	10	1	1			
FPN62	5652	ON-GRADE	5653	2.038	3	0.026	0.83	0.026	CMP	1.77	NO	42	0.026	0.013	0.74	2.04	0.68	1	5.77	42			1	1	
FPN62	**5652A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.74	0.74	0.63	1	2.53	10	1	1			
FPN62	**5652B**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.74	1.47	0.82	1	2.53	28	1	1			
FPN63	5656	ON-GRADE	5653	0.533	0	0.015	0.83	0.026	CMP	1.35	YES	48													
FPN64	5650	SAG	5649	6.495	4	0.011	0.83	0.026	CMP	1.12	NO	38	0.011	0.013	1.43	6.50	***1.23***	***1.5***	10.79	38			1		REUSE
FPN64	**5650A**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	5.72	1.36	1.5	7.45	5	1				1
FPN64	**5650B**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	4.29	1.22	1.25	4.58	5	1				1
FPN64	**5650C**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	2.86	1.05	1.25	4.58	5	1				1
FPN64	**5650D**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
FPN65	5648	SAG	5649	2.676	1	0.003	1.00	0.029	CMP	0.83	NO	45	0.003	0.013	1.56	2.68	1.13	1.25	3.37	45			1	1	
FPN65	**5648A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN66	5651	SAG	5648	0.479	0	0.002	0.83	0.026	CMP	0.53	YES	35													
FPN67	5626	ON-GRADE	5624	4.943	4	0.029	0.83	0.026	CMP	1.87	NO	31	0.029	0.013	0.98	4.94	0.93	1	6.08	31			1	1	
FPN67	**5626A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.98	1.96	0.91	1	2.53	10	1	1			
FPN67	**5626B**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.98	0.98	0.7	1	2.53	10	1	1			
FPN67	**5626C**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.98	1.96	0.91	1	2.53	26	1	1			
FPN67	**5626D**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.98	0.98	0.7	1	2.53	10	1	1			
FPN68	5625	ON-GRADE	5624	0.932	1	0.021	1.00	0.027	CMP	2.48	YES	25	0.021	0.013	0.82	0.93	0.53	1	5.15	25			1	1	
FPN68	**5625A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.82	0.82	0.82	1	2.53	10	1	1			
FPN69	5627	ON-GRADE	5624	1.563	1	0.025	0.83	0.027	CMP	1.67	YES	42	0.025	0.013	0.87	1.56	0.62	1	5.66	42			1	1	
FPN69	**5627A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.87	0.87	0.67	1	2.53	10	1	1			
FPN70	5633	SAG	5634	2.701	1	0.017	0.67	0.026	CMP	0.79	NO	29	0.017	0.013	1.56	2.70	0.82	1	4.67	29			1	1	
FPN70	**5633A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN71	5628	SAG	500	0.497	0	0.556	1.00	0.026	CMP	13.32	YES	4													
FPN72	5629	SAG	400	0.656	0	0.233	0.67	0.026	CMP	2.93	YES	22													
FPN73	5630	SAG	5634	0.611	0	0.036	1.00	0.026	CMP	3.38	YES	47													
FPN74	5637	ON-GRADE	5636	0.789	0	0.065	1.00	0.026	CMP	4.56	YES	26													
FPN75	5635	ON-GRADE	5636	1.413	0	0.069	1.00	0.026	CMP	4.69	YES	57													
FPN76	5631	SAG	5634	1.254	0	0.052	0.67	0.026	CMP	1.38	YES	43													
FPN77	5632	SAG	5634	4.324	2	0.061	1.00	0.026	CMP	4.40	YES	40	0.061	0.013	1.56	4.32	***0.77***	***1.25***	15.96	40			1	1	
FPN77	**5632A**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5	1	1			
FPN77	**5632B**	SAG				-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5	1	1			
FPN78	5638	ON-GRADE	5641	1.151	0	0.034	0.83	0.026	CMP	2.03	YES	22													
FPN79	5640	ON-GRADE	5641	1.262	1	**0.005**	0.83	0.026	CMP	0.78	NO	9	0.005	0.013	0.97	1.26	0.77	1	2.53	9			1	1	
FPN79	**5640A**	ON-GRADE				-	-	-		-	-	-	0.005	0.013	0.97	0.97	0.97	1	2.53	10	1	1			
[12]FPN80	3961	SAG	15944	4.883	3	0.021	0.67	0.009	PVC	2.55	NO	89	0.021	0.013	1.43	4.88	0.98	1	5.20	89			1		REUSE
[12]FPN80	**3961A**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
[12]FPN80	**3961B**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
[12]FPN80	**3961C**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
[12]FPN81	3960	SAG	15944	1.878	1	0.017	0.67	0.009	PVC	2.25	YES	108	0.017	0.013	1.43	1.88	0.71	1	4.59	108			1		REUSE
[12]FPN81	**3960A**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
[12]FPN82	8551	SAG	5639	3.267	2	0.010	3.50	0.014	CONCRETE	91.78	YES	310	DO NOT REPLACE												
[12]FPN82	**8551A**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
[12]FPN82	**8551B**	SAG				-	-	-		-	-	-	0.005	0.013	1.43	1.43	0.81	1	2.53	5	1				1
[12]FPN83	8162	SAG	8551	1.31	0	0.010	3.50	0.014	CONCRETE	92.73	YES	106													
FPN84	5777	ON-GRADE	5776	0.68	0	0.053	0.83	0.026	CMP	2.54	YES	18													
FPN85	5775	ON-GRADE	5776	0.364	0	0.075	0.83	0.026	CMP	3.00	YES	10													
FPN86	5778	ON-GRADE	5780	0.472	0	0.034	0.83	0.026	CMP	2.01	YES	22													
FPN87	5779	ON-GRADE	5780	0.83	0	0.035	0.83	0.026	CMP	2.06	YES	7													
					56														Totals:	1587	53	43	33	30	10
																			1' Pipe Total (ft):	1334					
																			1.25' Pipe Total (ft):	210					
																			1.5' Pipe Total (ft):	43					
																			Check:	1587					
																				(Must update total by hand)					

Basin Label	[2]Node (Structure ID)	Inlet Type	[1]Mainline Manhole for Inlet(s) Discharge	[1]10-Yr, 2-Hr Required Capacity (Max Flow from XPSWMM) (cfs)	[1,3]Existing Inlet Lead Slope (ft/ft)	[1]Existing Inlet Lead Diameter (ft)	[1]Manning Coefficient	Pipe Type	[4]Existing Inlet Lead Capacity (cfs)	Existing Inlet Lead Capacity Sufficient	[1]Existing Inlet Lead Length (ft)	USED Inlet Lead Slope (ft/ft)	USED Assumed Manning Coefficient for Concrete Pipe	[10]Grate Capacity With Clogging Factor (cfs)	USED [9]Required Pipe Capacity (cfs)	[6]Minimum Required Inlet Lead Diameter (ft)	USED [7]Required Inlet Lead Diameter (ft)	USED [4a]Inlet Lead Capacity (cfs)	[5]Additional Inlet Lead Piping (ft)
FPS1	6024	SAG	6026	2.678	0.012	0.83	0.009	PVC	3.44	YES	32	0.012	0.013	1.56	2.68	0.87	1	3.88	32
FPS1	**6024A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS2	6025	SAG	6026	0.833	0.077	0.67	0.017	CLAY	2.58	YES	15								
FPS3	6023	SAG	6026	2.598	0.030	0.67	0.009	PVC	3.02	YES	45	0.030	0.013	1.56	2.60	0.72	1	6.15	51
FPS3	**6023A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS4	5722	ON-GRADE	5724	0.621	0.049	0.67	0.017	CLAY	2.06	YES	36								
FPS5	5725	ON-GRADE	5724	0.396	0.076	0.67	0.017	CLAY	2.56	YES	26								
FPS6	5726	ON-GRADE	5729	0.301	0.044	0.67	0.02		1.65	YES	19								
FPS7	5727	SAG	5729	0.664	0.023	0.67	0.017	CLAY	1.40	YES	23								
FPS8	5728	ON-GRADE	5729	0.389	0.017	0.67	0.017	CLAY	1.19	YES	41								
FPS9	5719	ON-GRADE	5717	0.346	0.054	0.67	0.017	CLAY	2.16	YES	16								
FPS10	5721	SAG	5717	2.12	**0.005**	1.25	0.014	CONCRETE	4.25	YES	124	0.005	0.013	1.56	2.12	***0.94***	***1.25***	4.58	124
FPS10	**5721A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS11	5720	SAG	5721	3.14	0.004	0.67	0.012	CONCRETE	0.83	NO	25	0.004	0.013	1.56	3.14	1.13	1.25	4.10	25
FPS11	**5720A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS12	5718	ON-GRADE	5717	2.132	0.027	0.67	0.02	CLAY	1.30	NO	22	0.027	0.013	0.95	2.13	0.68	1	5.89	22
FPS12	**5718A**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.95	0.95	0.7	1	2.53	10
FPS12	**5718B**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.95	1.91	0.9	1	2.53	20
FPS13	5715	SAG	5717	3.11	0.026	0.83	0.012	CONCRETE	3.84	YES	53	0.026	0.013	1.56	3.11	0.79	1	5.77	53
FPS13	**5715A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS14	5716	ON-GRADE	5717	0.286	0.015	0.67	0.017	CLAY	1.12	YES	43								
FPS15	5714	SAG	9731	0.893	0.019	0.67	0.017	CLAY	1.28	YES	38								
FPS16	5713	SAG	9731	0.14	0.047	0.67	0.02	CLAY	1.71	YES	37								
FPS17	5751	ON-GRADE	5750	1.321	0.029	0.67	0.017	CLAY	1.58	YES	21								
FPS18	5749	ON-GRADE	5750	0.819	0.027	0.67	0.02	CLAY	1.29	YES	13								
FPS19	5712	SAG	9731	3.501	0.035	0.67	0.017	CLAY	1.74	NO	33	0.035	0.013	1.56	3.50	***0.79***	***1.25***	12.13	33
FPS19	**5712A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5
FPS19	**5712B**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS20	5710	SAG	5711	0.451	**0.005**	0.67	0.026	CMP	0.43	NO	8	0.005	0.013	1.56	0.45	0.52	1	2.53	8
FPS21	5706	ON-GRADE	5707	1.577	0.020	1.00	0.013	CONCRETE	5.05	YES	23	DO NOT REPLACE - 2010 CONSTRUCTION							
FPS22	5707	SAG	5705	5.836	0.020	1.00	0.013	CONCRETE	5.05	NO	44	0.020	0.013	1.56	5.84	1.060	1.250	9.16	44
FPS22	**5707A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5
FPS22	**5707B**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS23	5708	ON-GRADE	5709	0.568	0.020	1.00	0.013	CONCRETE	5.05	YES	23								
FPS24	5704	ON-GRADE	5705	0.482	0.020	1.00	0.013	CONCRETE	5.05	YES	23								
FPS25	5709	ON-GRADE	5705	0.67	0.020	1.00	0.013	CONCRETE	5.05	YES	36								
FPS26	5701	SAG	5702	1.184	0.047	0.83	0.026	CMP	2.38	YES	21								
FPS27	5703	SAG	5702	3.874	0.020	1.00	0.013	CONCRETE	5.05	YES	13	DO NOT REPLACE - 2010 CONSTRUCTION							
FPS27	**5703A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS28	5606	SAG	5607	0.792	0.033	1.50	0.009	PVC	27.76	YES	28								
FPS29	9733	SAG	5606	0.675	**0.005**	0.83	0.026	CMP	0.78	YES	4	0.005	0.013	1.56	0.68	0.61	1	2.53	4
FPS30	5609	SAG	5608	3.536	**0.005**	0.83	0.014	CONCRETE	1.44	NO	5	0.005	0.013	1.56	3.54	1.14	1.25	4.58	5
FPS30	**5609A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5
FPS30	**5609B**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS31	5608	SAG	5607	2.2819	0.055	1.50	0.026	CMP	12.32	YES	20	0.055	0.013	1.56	5.82	***0.93***	***1.5***	24.63	20
FPS31	**5608A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	1.08	1.25	4.58	5
FPS31A	16639	SAG	5607	0.99	0.021	1.50	0.009	PVC	21.89	YES	30								
FPS32	5611	ON-GRADE	5612	0.421	0.021	0.67	0.029	CMP	0.79	YES	26								
FPS33	5610	ON-GRADE	5612	1.564	0.025	0.83	0.009	PVC	4.97	YES	37	0.025	0.013	0.97	1.56	0.62	1	5.60	37
FPS33	**5610A**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.97	0.97	0.7	1	2.53	10
FPS34	5671	ON-GRADE	5672	0.699	0.014	0.83	0.026	CMP	1.32	YES	35								
FPS35	5672	ON-GRADE	5669	2.834	0.046	1.00	0.026	CMP	3.81	YES	42	0.046	0.013	0.90	3.53	0.75	1	7.63	42
FPS35	**5672A**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.90	0.90	0.68	1	2.53	10
FPS35	**5672B**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.90	1.80	0.88	1	2.53	25
FPS35	**5672C**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.90	0.90	0.68	1	2.53	10
FPS36	5670	SAG	5669	0.654	0.015	0.83	0.026	CMP	1.35	YES	7								
FPS37	5678	SAG	5677	2.731	0.107	1.00	0.026	CMP	5.85	YES	5	0.107	0.013	1.56	2.73	0.58	1	11.70	5
FPS37	**5678A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS38	5677	SAG	16637	2.014	0.009	1.50	0.009	PVC	14.51	YES	102	DO NOT REPLACE - THROUGH BACKYARDS							
FPS38	**5677A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS39	5683	SAG	5684	0.75	0.015	0.83	0.026	CMP	1.34	YES	29								
FPS40	5682	SAG	5684	2.038	0.012	0.83	0.026	CMP	1.22	NO	10	0.012	0.013	1.56	2.04	0.78	1	3.96	10
FPS40	**5682A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS41	5681	ON-GRADE	5680	1.773	0.046	0.83	0.026	CMP	2.35	YES	39	0.046	0.013	0.83	1.77	0.58	1	7.65	39
FPS41	**5681A**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.83	0.83	0.66	1	2.53	35
FPS41	**5681B**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.83	0.83	0.66	1	2.53	10
FPS42	5679	ON-GRADE	5680	0.995	0.227	0.83	0.026	CMP	5.23	YES	10								
FPS43	5675	ON-GRADE	5674	0.429	0.003	1.00	0.026	CMP	0.93	YES	49								
FPS44	5676	ON-GRADE	5675	0.7	0.001	0.83	0.026	CMP	0.41	NO	35	0.001	0.013	0.74	0.70	0.84	1	1.34	35
FPS45	5673	SAG	5674	5.32	0.009	0.83	0.026	CMP	1.06	NO	11	0.009	0.013	1.56	5.32	1.19	1.25	6.25	11
FPS45	**5673A**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS45	**5673B**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	3.12	1.08	1.25	4.58	5
FPS45	**5673C**	SAG			-	-	-		-	-	-	0.005	0.013	1.56	1.56	0.84	1	2.53	5
FPS46	5666	SAG	5667	0.349	0.005	1.00	0.026	CMP	1.30	YES	30								
FPS47	5665	SAG	5666	1.119	0.009	0.83	0.026	CMP	1.04	NO	25	0.009	0.013	1.56	1.12	0.66	1	3.39	25
FPS48	5668	SAG	5667	0.816	0.021	0.83	0.026	CMP	1.59	YES	49								
FPS49	5663	ON-GRADE	5664	3.473	0.020	1.00	0.026	CMP	2.49	NO	30	0.020	0.013	0.82	3.76	0.9	1	4.99	30
FPS49	**5663A**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.82	0.82	0.66	1	2.53	10
FPS49	**5663B**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.82	1.64	0.85	1	2.53	10
FPS49	**5663C**	ON-GRADE	[8]**MH 5663E**		-	-	-		-	-	-	0.005	0.013	0.82	0.82	0.66	1	2.53	10
FPS49	**5663D**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.82	1.64	0.85	1	2.53	4
FPS50	5662	ON-GRADE	5663	1.309	0.009	0.83	0.026	CMP	1.02	NO	35	0.009	0.013	0.75	1.31	0.7	1	3.31	35
FPS50	**5662A**	ON-GRADE			-	-	-		-	-	-	0.005	0.013	0.75	0.75	0.63	1	2.53	10
																		Totals:	958
																		1' Pipe Total (ft):	672
																		1.25' Pipe Total (ft):	266
																		1.5' Pipe Total (ft):	20
																		Check:	958

APPENDIX T
PROJECT NEWSLETTER

August 2010

Forest Park Area Storm and Sanitary Sewer Study

Flooding: Homeowner and City Collaboration

The City of Kenosha Stormwater Utility and Water Utility have combined efforts to address flooding issues in the Forest Park area. The Utilities and their engineering consultant have made a great deal of progress on the study by identifying problem areas and are now in the process of evaluating several alternatives and budgeting for improvements. Some of the alternatives being evaluated include pipe size upgrades to storm and sanitary sewer pipes.

Water Utility: Completed Projects & Continuing Priorities

The Kenosha Water Utility (KWU)continues to work on many fronts throughout the Forest Park Area. KWU has completed design and construction of the first phase of system improvements. These improvements included increasing the size of the main transmission sewer line serving the north portion of the Forest Park Basin along Pershing Boulevard from 60th to 61st Street, and on 61st Street from Pershing Boulevard to 46th Avenue; relay/replacement of under performing sewers on 46th Avenue, 47th Avenue, and 51st Avenue; spot repairs of deficient sewers identified through our sewer televising program; and repair of selected manholes identified through our manhole inspection program. To date, KWU has expended $972,000 on this project.

KWU has also completed the installation and start up of our new flow measurement/alarm system. This is an automatic flow monitoring system installed in various manholes throughout our system that provides us with real time flow and alarm information accessible to KWU continuously 24 hours per day. Two of these flow monitoring devices are located at strategic locations in the Forest Park Study Area. These flow monitoring devices will help us better understand the dynamics of our system during wet weather events and improve our response times to those events.

Additional priorities have been identified with contracts under development to enable this work to proceed yet this year. This work includes sewer up sizing/replacement on 69th Street from 47th Avenue west and spot repairs of deficient sewer segments in two additional locations. Further work by KWU crews will include additional manhole repairs in selected locations and spot repairs where testing has shown cross flow from the storm sewer system into the sanitary sewer system. Data collection and testing will continue as we strive to improve the performance of our collection system. These efforts will include additional smoke testing and storm sewer flooding/dye testing to help identify possible clear water entry points into the KWU system.

KENOSHA WATER UTILITY

KENOSHA Stormwater Utility
We have a stake in our lake!

Stormwater Utility: Completed & Upcoming Work

The Stormwater Utility has televised and cleaned the storm sewer pipes and structures. Manhole / Inlet inspections took place and corresponding rehabilitation. The Consultant and Utility have also met with Forest Park area individuals on specific drainage concerns. The Utility plans to complete additional manhole/inlet repairs. The Stormwater Utility had surveyors taking elevations of approximately 125 homes within the study area to determine if there are any structure impacts during specific rainfall events. This information will be used under a next step of the storm sewer evaluation. The Stormwater Utility has decided to expand the study to collect data that will identify impacts downstream that could be causing problems in Forest Park. This additional study will begin this month.

Homeowner Contributions

Homeowner's actions are an important link in reducing private inflow/infiltration (I/I) to the sanitary system.

Separation of perimeter foundation drains from the sanitary sewer lateral is one way to reduce inflow to the sanitary sewer. In order to reduce the amount of water being collected by perimeter foundation drains, homeowner's can evaluate their yard and driveway to ensure there is proper drainage away from the home's foundation and window wells. Another way to reduce inflow to the sanitary sewer system is to eliminate the connection of sump pumps to basement floor drains or sanitary sewer laterals. The additional volume of sump pump water entering the sanitary sewer system consumes capacity that should otherwise be used to convey wastewater or inevitable infiltration.

While out and about in your neighborhood, be sure to report any illegal dumping of material into the storm sewer system (i.e. concrete trucks washing to inlets, etc.). Also, during the fall/winter it is important to help keep catch basins free of leaves, snow and ice.

Upcoming Schedule:

Mid-Fall 2010: Workshop 3

Project Contact Information:

For more information about the Forest Park Area Project, please contact:
Shelly Billingsley
Kenosha Stormwater Utility Assistant City Engineer
625 52nd Street, Room 305
Kenosha, WI 53140
(262) 653-4150
sbillingsley@kenosha.org

Helpful Web sites:

Sewer Backup Information – http://www.kenoshawater.org/sewer_maintenance.html
University of Wisconsin Extension - http://clean-water.uwex.edu/pubs/
Milwaukee Metropolitan Sewage District - http://v3.mmsd.com
Homeowner's Guide - http://www.edmonton.ca/for_residents/ForHouseholds/Homeowners_Guide.pdf

KENOSHA WATER UTILITY — MUNICIPAL WATER & SEWER SERVICE — SINCE 1899

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For more location information please visit www.strand.com

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