

advance whistle boards were posted at milepost 7.0 and 6.0 respectively.

The area comprised four main tracks for high-speed passenger trains. Between Curtis Park and Darby Stations, the trackage curved toward the right. Track No. 4 was a 1-degree to 1-degree, 12-minute compound curve with a 3-inch designated elevation. The outermost west track, its right-of-way dropped off to a steep embankment. Permanent curvature speed restrictions were posted with a maximum allowable speed of 70 mph on Tracks Nos. 1 and 4, 80 mph on Track No. 2, and 90 mph on Track No. 3.

The standard track movement was directional south to north on Tracks Nos. 1 and 2, and north to south on Tracks Nos. 3 and 4. Local businesses such as car repair facilities and shopping stores were located near the area, but did not impose any additional environmental noise hazards.

Train movements were governed by a Traffic Control System (TCS) signalled for traffic in both directions on all tracks. Movements were controlled by the Dispatcher at ATK CETC in Philadelphia, PA, and supplemented by an Automatic Train Control system on board the locomotives.

In accordance with ATK's CETC dispatcher's log, ATK and the Southeastern Pennsylvania Transportation Authority (SEPTA) commuter rail service operated a combined total of 15 trains between the hours of 9:30 a.m. and 11:33 a.m. past Curtis Park Station without incident. Statements from the Engineers of those trains who were contacted following the accident revealed no exceptions to the way protection was provided nor any irregularities among any of the Watchmen.

The Gang Watchman was stationed at Curtis Park on the east side of Track No. 1. An advance Watchman was about three catenary poles north of the Gang Watchman on the west side of Track No. 4; and the third northernmost advance Watchman was stationed approximately four catenary poles north of the second Watchman, also on the west side of Track No. 4. A Watchman's post was situated near this area of the right-of-way for the safe observation of trains.

The B&B Foreman for Gang C312 had obtained on-track protection (foul time) for Tracks Nos. 1 and 2 on two different occasions prior to 10:33 a.m. At that time, a Maintenance-of-Way Foreman located at Penn Interlocking obtained Form D Permit No. A1405 from the ATK CETC dispatcher to take Track No. 1 out of service between Phil Interlocking and Baldwin Interlocking for right-of-way cleanup south of Curtis Park Station. Upon notification by the CETC dispatcher of the change in operations on Track No. 1 at 10:41 a.m., the B&B Foreman for Gang C312 informed the Gang and the Gang Watchman; however, he did not inform the southernmost Watchman and the two northernmost advance Watchmen that Track No. 1 would be out of service. Subsequently, on-track permission (two in total) was obtained by the B&B Foreman for Gang C312 for Track No. 2 only with the last released to CETC at 11:13 a.m. for the approach of

ATK Passenger Train No. 20, a daily train en route northbound from Washington, DC to New

York on Track No. 2.

SEPTA Passenger Train No. 4634 entered the block at Baldwin Interlocking at 11:12 a.m. It was routed northbound onto Track No. 4 due to Track No. 1 being out-of-service and had seven additional stops to make before it's arrival at Curtis Park Station. The train consisted of four multiple-unit, electrically propelled locomotives (MU), with No. 139 in the lead, and Nos. 140, 355, and 354 following in sequence. The Engineer was located at the controls, and the Conductor was in the passenger compartment of the lead car.

At 11:26 a.m., ATK Train No. 20 entered the block at Baldwin Interlocking and continued northbound on Track No. 2. The Gang was alerted of the approach of ATK Train No. 20 by the southernmost advanced Watchman who blew his air horn and raised his disk. The other Watchmen followed in succession, raising their disks and blowing their air horns, until all had cleared the tracks for its passage. As SEPTA Train No. 4634 arrived and stopped at Curtis Park Station on Track No. 4 at approximately 11:30 a.m., ATK Train No. 20 passed.

When ATK Train No. 20 cleared the work area without incident, the Gang remained clear and the Watchmen's disk remained raised because the SEPTA train was still in the station. In his statement, the Engineer of ATK Train No. 20 indicated the northernmost Watchman glanced upward toward his locomotive compartment as the train proceeded through the area and held his disk raised in the same manner as the others in acknowledgment of his passage. The Engineer stated he noted no discrepancies during that operation.

The weather conditions at the time of the accident comprised calm winds and overcast skies with good visibility, limited only by line of sight. The temperature was 56° F.

The Accident

Upon departure from the Curtis Park Station at 11:32 a.m., SEPTA Train No. 4634 progressed onto Track No. 4. Statements from the Foreman-in-Charge, other Watchmen, and Gang Members verified that the train's ditch lights were on and flashing, its headlight was brightly illuminated, and the Engineer was sounding the horn. As the train rounded the curve, the Engineer noted the northernmost Watchman along the right-of-way of Track No. 4 and sounded his horn several times. The Engineer stated that the Watchman's disk was raised in the air, giving him the impression that he heard the train whistle and was acknowledging the train's approach. The Engineer then realized the Watchman was within the envelope (foul limits) of the trackage, had his back toward the oncoming train, and was not moving to clear. The Engineer stated he then placed the throttle in idle while continuing to sound his horn, applied an initial 5-pound brake reduction, and two seconds later, placed the train into emergency braking.

The northernmost Watchman was struck by the left front step portion of MU No. 139, the lead unit of SEPTA Train No. 4634, at approximately 11:32 a.m. at milepost 6.3. The Engineer of SEPTA Train No. 4634 immediately notified ATK CETC that he thought he had struck someone and requested police and emergency medical assistance.

In accordance with SEPTA's event recorder tapes retrieved from SEPTA Train No. 4634, the speed at impact was 57 mph. The train came to a complete stop 1,044 feet from the point at which the emergency brakes were applied.

The Watchman's body was found approximately 83.8 feet from the estimated point of impact and 73 feet down the steep embankment along the right-of-way of Track No. 4. An employee of a nearby company witnessed the accident and was also the first to reach the body. He stated that he also asked his co-workers to call 911 for emergency response. Darby Police and Medical Emergency Response Personnel arrived at the scene at 11:36 a.m. The Watchman was pronounced dead at the scene at 11:45 a.m. by the MFH-EMS medic.

(Please see the attached diagrams of the Curtis Park Station and ATK's main line route discussed in the report, to visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

The installation of the inter-track fencing between Tracks Nos. 2 and 3 between Curtis Park and Darby Stations was a proposed 2-week project. The B&B Gangs began their initial work on Thursday, Oct. 30, 1997, three days prior to the accident date.

However, it was revealed that the actual on-track working time was very limited due to the inability to secure sufficient on-track protection (foul time) and equipment problems while on location. In all, it was estimated that 12 on-track working hours were performed during this period.

As previously stated, the B&B Foreman for Gang C102, the Foreman-in-Charge, gave the initial job briefing at the beginning of the work day on Nov. 4, 1997. Our investigation found that this Foreman was not the person designated to provide on-track protection; therefore, he should not have performed the job briefing. As specified in 49 CFR Part 214.315 (d) of the Roadway Worker Protection standards, the job briefing duties should have been those of the B&B Foreman for Gang C312, who was designated to provide the on-track protection. A job briefing documentation sheet listing all pertinent information covered during the job briefing was signed by each employee each day while assigned to that location, except for the Foreman-in-Charge on the day of the accident. This sheet also listed the B&B Foreman for Gang C312 as the person designated to provide on-track protection. It was also revealed that the Foreman-in-Charge was not qualified on the physical characteristics of the area; however, the Foreman for Gang C312 was qualified on the physical characteristics of the area. Statements made by the employees and the job briefing documentation sheets uncovered conflicting information regarding specific topics discussed during the job briefing such as train speeds, the Northeast Operating Rules Advisory Committee's (NORAC) Rule 261 which governed train operations in this area, and the possibility of 2-way traffic on each track. Rule 261 states that signal indication will be the authority for a train to operate in either direction on the same track. However, having worked in the area on previous occasions, the employees stated they knew and understood the operations.

The ATK CETC train dispatcher's logs indicated trains had operated under normal standard movements since the project had started on Oct. 30, 1997. During the morning of November 4, the B&B Foreman for Gang C312 had requested, secured, and released on-track protection on two different occasions for Tracks Nos. 1 and 2 prior to the Dispatcher notifying him that an MOW Foreman at Penn Interlocking had taken the main track (Track No. 1) out of service for right-of-way track cleanup at 10:33 a.m. At that time, the B&B Foreman for Gang C312 only informed the first north Watchman stationed at the work location and Gang members.

The southernmost and the two northernmost Watchmen were not informed of the change in operations. Thereafter, the B&B Foreman for Gang C312 secured and released on-track protection two additional times for Track No. 2, the last released at 11:13 a.m. for the approach of ATK Train No. 20 entering the block at Baldwin northbound on Track No. 2.

Inquiries disclosed that SEPTA Train No. 4634 was the first northbound move of the day and while the B&B Gangs were present since the job started on Oct. 30, 1997 on Track No. 4. In addition, because the move was made necessary by Track No. 1 being out of service for the first time since the project began, it was also the first time two northbound trains had occupied the block simultaneously. Interviews held after the accident divulged that although the Gang members were aware of NORAC's Rule 261, some were still surprised to see SEPTA Train No. 4634 approaching northbound on Track No. 4. Moreover, the northernmost Watchman was in possession of a hand-held radio; however, it was not used for protection purposes but for notification of breaks and lunch periods. It was also revealed that while SEPTA Train No. 4634 was still at the Curtis Park station, the Foreman-in-Charge (Gang C102) had spoken to the Watchman over the radio just prior to the accident to ascertain if the Watchman was feeling any fatigue in his duties. The Foreman stated the Watchman responded that he was doing fine.

Maintenance, inspections, and tests performed by SEPTA personnel on the morning of the accident and during post-accident investigations indicated no exceptions taken in the mechanical operations of SEPTA Train No. 4634. The damage reported as a result of the accident to Car No. 139, the lead car, was relatively minor. A metal panel of the left front steps was severely bent inward with the frame melding severed; it was found later down the embankment along the right-of-way of Track No. 4.

Personnel data regarding the SEPTA Engineer and Conductor revealed both were up-to-date to within the last year for all qualifications, rules tests, and physicals. FRA mandatory post-accident toxicology tests and drug and alcohol tests administered by a SEPTA company were performed on the SEPTA Engineer and Conductor. The results were negative.

Statements made by both Foremen and the Gang members in post-accident interviews regarding the northernmost Watchman struck by SEPTA Train No. 4634, were very positive. In fact, the Watchman was described as being dependable, hard-working, quiet, and willing to help in any way to complete the job.

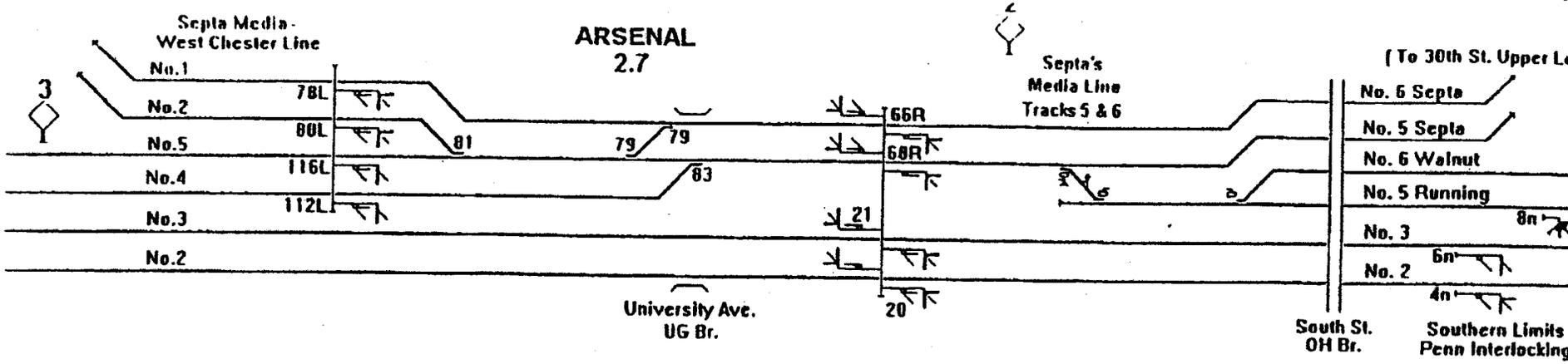
A summary of the Watchman's prior 30-day work schedule disclosed that he had reported for

work the majority of days, taking only two vacation days. In addition, for one week during that period, he worked as Acting Foreman for the Gang. Also, on many days, he worked a half-hour to an hour in excess of his scheduled working hours. Co-workers stated that the Watchman had volunteered the morning of the accident to work overtime; however, not enough men volunteered, and the overtime was eliminated. Moreover, the Watchman had volunteered to work the position of Advance Watchman for that day's work, as was the routine for those qualified to assign themselves as Watchman on a volunteer rotational basis. Roadway Worker Protection records derived from ATK's Human Resources Development employee transcript reflected that the Watchman was qualified on Roadway Worker Protection Against Trains in April 1996 and January 1997 respectively. In addition, he was qualified on Roadway Worker Protection Equipment in June 1996.

Mandatory FRA post-accident toxicology testing performed at NWT revealed the northernmost Watchman was positive for ethyl alcohol, with a presence of 0.027 percent in his blood sample and 0.061 percent in his urine sample. Further review by Greystone Health Sciences, Inc. concluded that the presence of ethyl alcohol in the Watchman's blood was likely due to pre-death (antemortem) ingestion. Statements by both Foremen and Gang members during our post-accident interviews disclosed that they did not identify any irregularities or signs of impairment that could have impeded the Watchman's performance.

FRA has determined the failure of the northernmost Watchman to remain clear of the right-of-way as the probable cause of death; however, alcohol consumption may have caused him to be inattentive to imminent danger and contributed to his failure to remain clear of the right-of-way.

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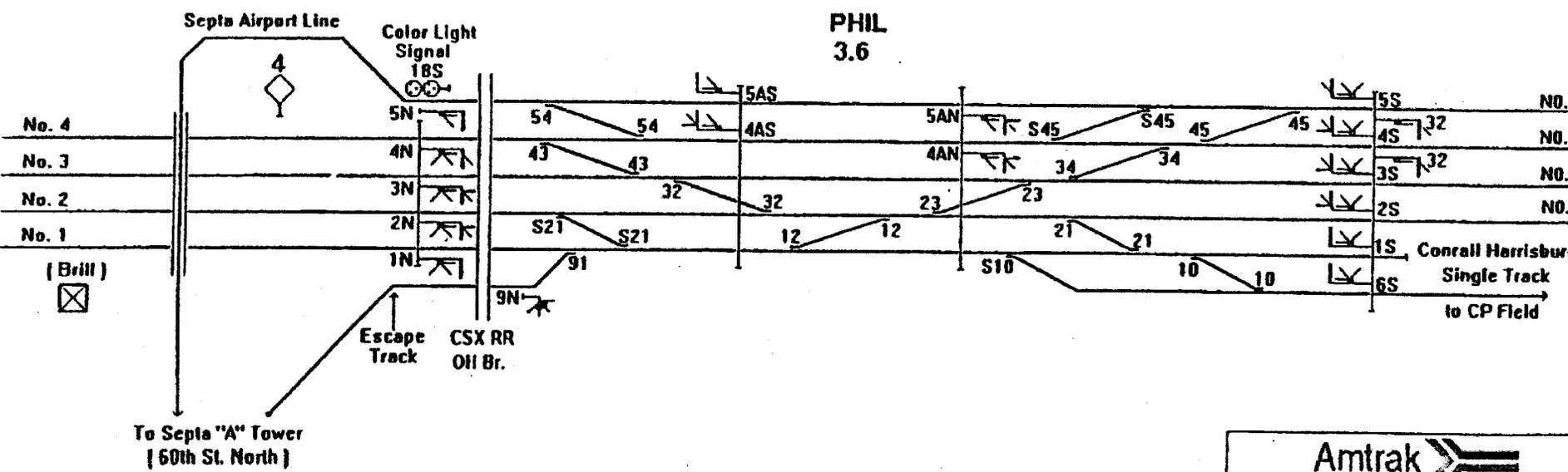


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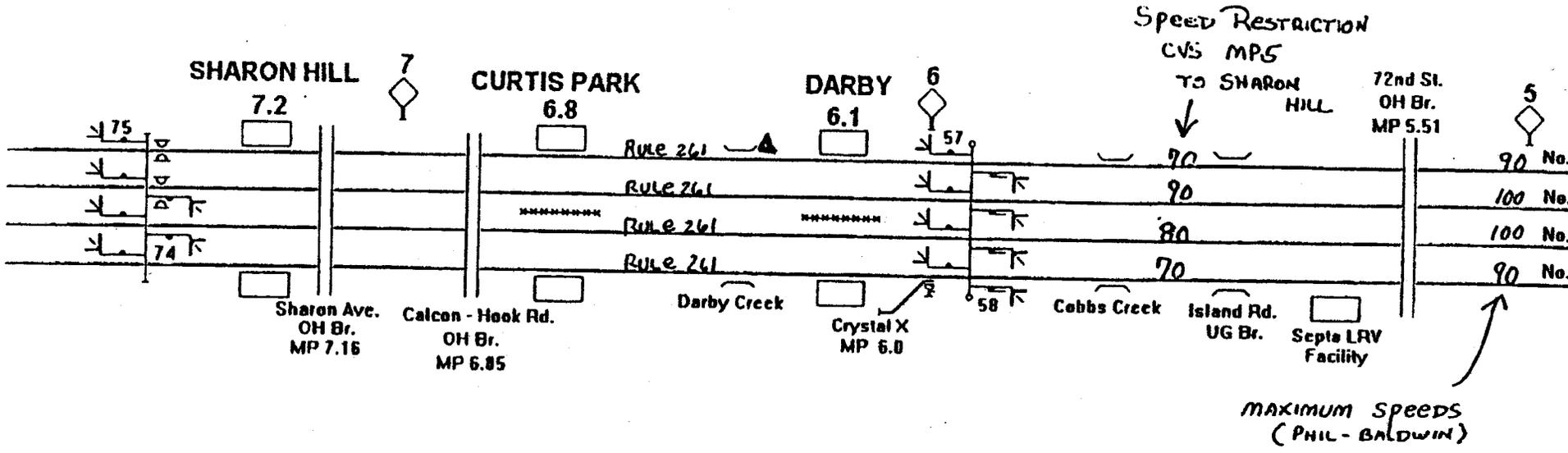
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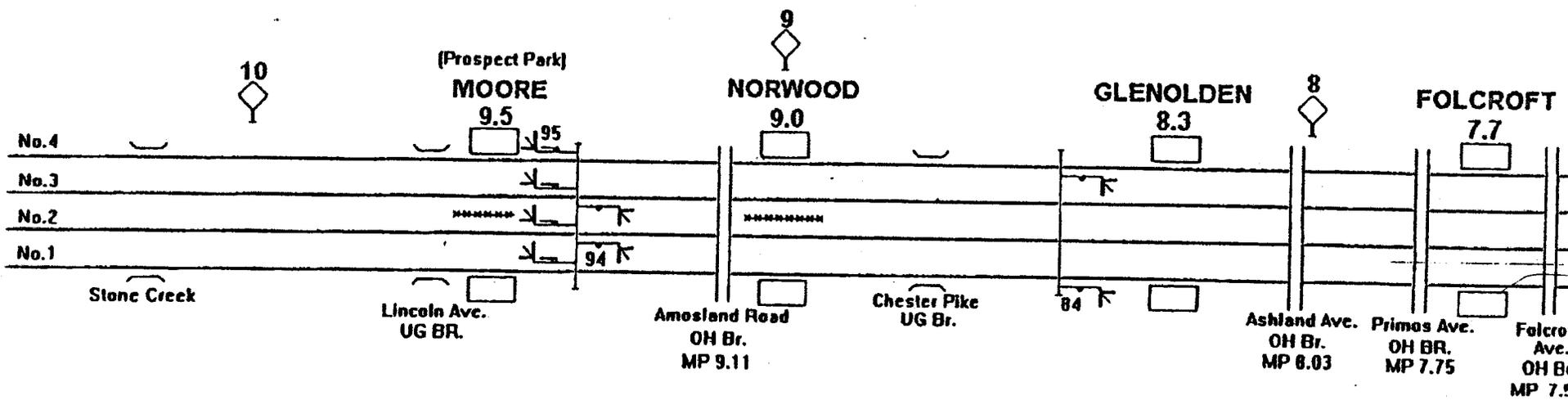
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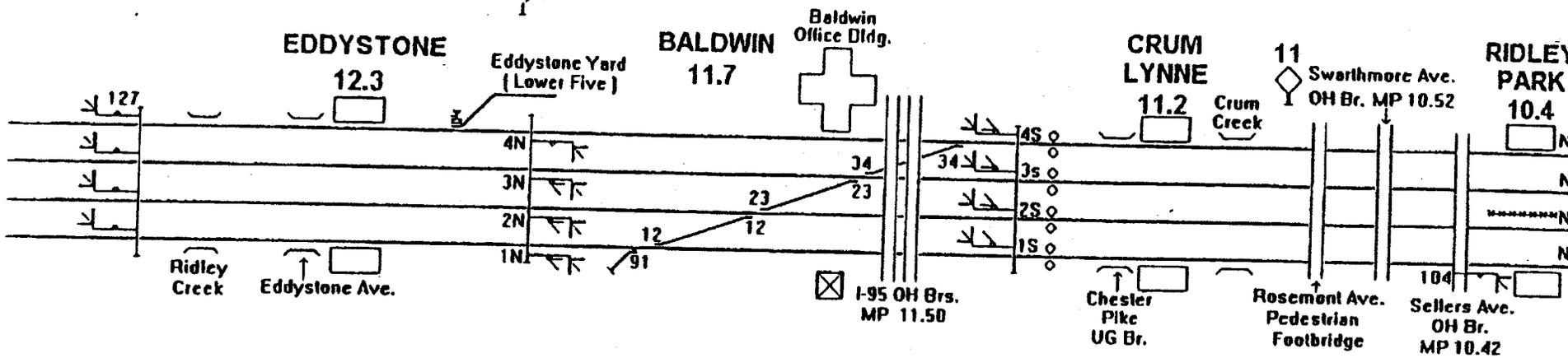
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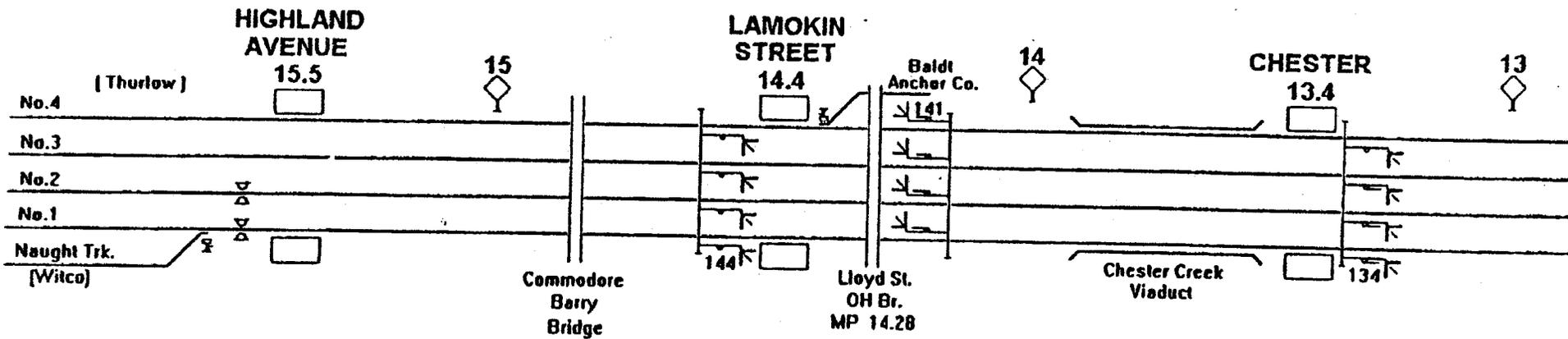


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□ CatPole

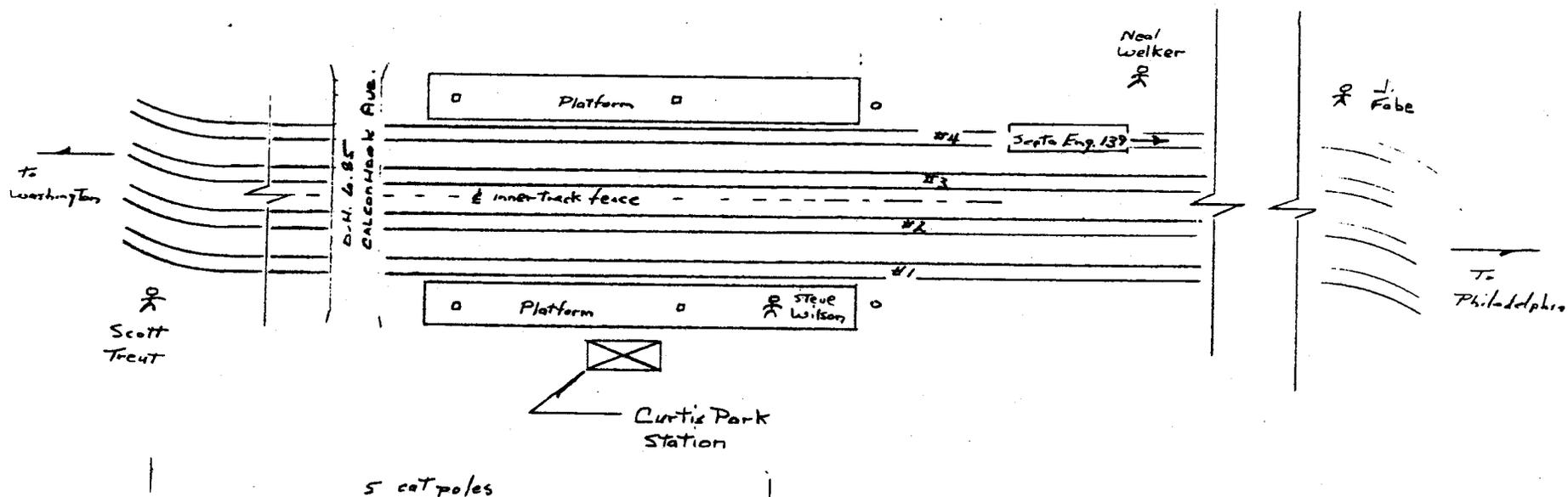
⊠ watchmen

≈ 586

- Dimensions Approximate
- Locations of watchmen as stated themselves.

3 catpoles

4 catpoles??



Curtis Park, VA.

T.M.