Aerobic Base Building

Created by **Tom Scotto / Cycling Fusion**
Training Type: **Aerobic Development / Aerobic Endurance**
Working HR Zones: **Zone 1 to Zone 4**
Cycling Specificity: **2**
Total Class Length: **60 minutes**

PROFILE DESCRIPTION

This profile is called ***Aerobic Base Building***. It is a hybrid profile consisting of a sample of drills that focus on aerobic development and aerobic endurance. Each focus can be a class in and of itself, or both focuses can be combined to create a single class. Often times aerobic development is introduced earlier to help riders prepare for longer endurance efforts.

The sample drills:

Warm-up Notes

Aerobic Development: Seated 30-Second Intervals
4 to 6 seated aerobic efforts lasting 30 seconds each. 30 seconds of recovery between each interval.

Aerobic Development: Standing 30-Second Intervals
4 to 6 standing aerobic efforts lasting 30 seconds each. 30 seconds of seated recovery between each interval.

Aerobic Development: Seated-Standing 60-90-Second Intervals
2 to 3 aerobic efforts lasting 60-90 seconds each. 60-90 seconds of seated recovery between each interval.

Aerobic Endurance: 2-3 Minute Interval
Seated aerobic effort lasting 2 to 3 minutes. Recovery should equal ½ of the length of the interval.

Aerobic Endurance 4-6+ Minute Interval
Seated aerobic effort lasting 4 to 6+ minutes. Simulate a steady-state rolling road with optional 10 to 15 second standing efforts. Recovery should equal ½ of the length of the interval.

Active Recovery, Cool-down and Stretch

OBJECTIVE AND INTENSITY

Aerobic base building is one part of base fitness cyclists focus on during the early months of the season or year (January – March). In addition to building an aerobic base, cyclists also focus on leg speed development, pedal stroke technique and muscular endurance.

Endurance is a Dirty Word

Endurance has gotten a bad rap in indoor cycling because it is often misunderstood and confused. First, it has been confused with what many outdoor riders do during the early season referred to as LSD (Long Slow Distance). More recent research has "updated" this term and redefined LSD as Long STEADY Distance. These steady endurance efforts are often 90+ minutes in length (pros will ride 4-6 hours) to effectively deplete glycogen (fuel) stores and allow a rider to become more efficient at using fat as fuel. In addition, the longer ride times self-regulate the intensity level. It is easy to fall into a trap of pushing too hard during a 60 minute ride. This temptation is greatly reduced when one knows they will be riding for 90+ minutes.

Also, because of how strongly LSD is emphasized in the early months of training it has overshadowed other needed elements of aerobic base building. These other elements or types of aerobic base building are what we will focus on and are most applicable to the indoor cycling studio.

Combined with the above confusion is the misunderstanding that aerobic work is always easier. This is probably due to it being incorrectly compared to "anaerobic work". I'm not going to dive into the world of aerobic and anaerobic pathways because it requires much more depth that what is appropriate with this profile. However, in order to help you target these efforts correctly we will discuss both the Heart Zones® focus and the impact of cadence.

Heart Zones® Focus

The key to aerobic base building is….well…to apply focused stress on the aerobic system. The aerobic system is the energy pathway that relies on the use of oxygen. So what intensity levels are appropriate to work in this energy pathway?

In Heart Zones® training, appropriate stress is placed on the body through understanding physiological thresholds. These thresholds are various points (or places we cross) as we progress through higher and higher intensity levels. The best way to find these thresholds is to perform a VO2 or Lactate Threshold test.

VO2 testing will determine 3 thresholds, the first ventilatory threshold (VT1), the second ventilatory threshold (VT2) and VO2max (aerobic capacity). Ventilatory threshold is also referred to as respiratory threshold.

Lactate Threshold testing will determine the initial change in steady blood lactate accumulation as the first threshold (LT1) and the second change in this accumulation as the second threshold (LT2).

Although all of the thresholds have a purpose, we are going to focus on this second threshold (VT2 or LT2) for the upper limit of our aerobic base building. We will refer to it as T2 (Threshold 2)

When you get tested, targeting T2 is easier because it will be associated with a specific heart rate number. This is one of the reasons training with a heart rate monitor is valuable as it allows you to specifically and effectively "stress" the body.

It is also important to know how T2 feels if riders do not have a heart rate monitor or they want to match the heart rate to a perceived level of effort. Using the 1 to 10 RPE scale, T2 is close to a 7 (hard). Using a percentage of perceived effort (not max HR) it is often expressed as 80-85%. It is the point where a rider feels their already strong (but sustainable) breathing is about to become difficult. This can also be described as the beginning of breathless or the beginning of red line.

Target Cadences for Aerobic Efforts

Understanding the effects of cadence will help riders better receive the benefits of aerobic base building. Leg speeds below 80 RPM tend to place additional stress on the muscles of the legs creating a greater focus on strength rather than cardio fitness. Leg speeds between 80-100 RPM are more effective for targeting aerobic efforts (stressing the cardio-respiratory system) because, with appropriate resistance, produce a higher heart rate without emphasizing muscular strength.

Intermediate Recovery Aerobic Development Sets

Encourage riders to recover when they feel the need, however not much recovery is built into this type of ride because of the lower overall intensity and steady "stress" on the aerobic system. The time it takes you to introduce and explain each set (30-60 seconds) at the beginning of each song should be adequate in giving riders a quick breather while not allowing heart rates to drop too low.

Depending on how you string these drills together, you may find your riders in need of recovery after 2-4 consecutive sets. In this case, giving them a 3-5 minute time to recovery in Zone 2 or 60-65% of their perceived effort is appropriate before continuing.

THE DRILLS

The Warm-up Notes

(6-10 Minutes)

The warm-up for aerobic base building workouts does not require any special treatment and often easily transitions into the first drill or set of work.

CAUTION RIDERS: Intensity vs. Duration vs. Short Recovery Periods
Riders often look at aerobic base building classes as EASY because they are usually only considering the level of intensity and not other factors. I like to "warn" them which gets their attention. They will think " why is the instructor cautioning me when the intensity is not going to be that high?"

The fact of the matter is aerobic development and aerobic endurance drills do not provide much recovery and the efforts tend to be longer. The emphasis is not on intensity BUT on duration and short recovery times. Remember, although the format of the below drills are intervals, riders will find themselves hovering close to 80-85% of their ability (T2) for a good portion of the class. This is hard and nothing to take lightly.

Make sure riders work at their own pace and emphasize QUALITY over QUANTITY. It is better for them to perform fewer targeted efforts than many mediocre ones.

Aerobic Development: Seated 30-Second Intervals
Length: 4-6 Minutes
Intensity: 70-80% PE / Zone 3-4
Cadence: 80 – 100 RPM

The purpose of this drill is to build some initial aerobic stamina with short aerobic efforts. Riders will have to continue to experiment with how much resistance to use and the leg speed they can maintain. Encourage this learning process.

> *We are going to alternate between an easy flat road and a noticeably harder effort that puts our breathing in a bit of difficulty.*
>
> *Let's begin by finding a leg speed of 80 RPM or above (use the tempo of the music, cadence check or bike computer).*
>
> *Now let's add enough resistance so we can feel the road under us and remain in control of our momentum.*
>
> *For 30 seconds you will continue to pedal at the same speed but with added resistance. They you will have 30 seconds to recovery before the next effort. Experiment with your resistance and make sure your cadence does not slow down.*

4…3…starting adding resistance….2….maintain your speed….1…you've got 30 seconds…

Stay calm: Relax and breathe

Hold it for 4…3….2…1… OK now return to an easy but noticeable road and recovery for 30 seconds.

[riders with a heart rate monitor who know their T2 should be encouraged to target that heart rate for each interval]

Aerobic Development: Standing 30-Second Intervals
Length: 4-6 Minutes
Intensity: 70-80% PE / Zone 3-4
Cadence: 80 – 100 RPM

The purpose of this drill is to build aerobic stamina with short standing aerobic efforts. Riders will have to continue to experiment with how much resistance to use out of the saddle and the leg speed they can maintain. Encourage this learning process.

We are going to alternate between a moderate flat road and standing. Our goal is to be able to stand without changing our leg speed. This may not be possible at first so work at your own pace and try to maintain a speed you can sustain. Skip a standing effort if you need more time to recover.

Let's begin by adding enough resistance to allow us to stand safely and remain in control at a faster leg speed.

Our intention is to push hard enough to allow our breathing rhythm to become challenged but THIS IS NOT A SPRINT. It is a steady effort.

In 4…3…add additional resistance if needed…2...1 come out of the saddle and maintain that steady effort.

Your heart rate will naturally increase. Continue to remain relaxed and breathe.

[after 30 seconds] return to the saddle and return to a moderate flat road. Keep in mind that although you have 30 seconds to recover, this will most-likely not be sufficient and heart rates are likely to continue escalating with each interval. If you become breathless, skip an interval and wait for the next one.

Aerobic Development: Seated-Standing 60-90-Second Intervals
Length: 4-6 Minutes
Intensity: 70-80% PE / Zone 3-4
Cadence: 80 – 100 RPM

The purpose of this effort is to add additional stress on the aerobic system by increasing the length of time for each interval to 60 or 90 seconds. You can also choose a 45-second option if you feel an intermediate step is needed with your class. You can simple increase the amount of time of each interval or add a 10 to 30-second standing effort at the end of each effort.

NOTE: It is not recommended to have riders attempt the entire aerobic development interval out of the saddle since this often spikes the heart rate above the desired intensity/threshold (T2).

> *We are going to increase the amount of time for each interval so do your best. You may find that you are not able to hold the same high level of intensity as with the short efforts. Continue to experiment and learn what your body can do.*
>
> *We have 2 options:*
>
> *Option 1: Add enough resistance to create an easy flat road and then add resistance without changing your leg speed and hold it for the entire interval.*
>
> *Option 2: Add enough resistance so you can safely stand without allowing your leg speed to slow down. Begin each aerobic interval seated. I'll let you know when we have 30, 20, 15 and 10 seconds left. You can choose to stand at any point in the last 30 seconds.*
>
> *You will be able to recovery for the same amount of time as the interval.*

Aerobic Endurance: 2-3 Minute Interval
Length: 2-3 Minutes
Intensity: 70-75% PE / Zone 3 to Low Zone 4
Cadence: 80 – 100 RPM

The purpose of this effort is to apply stress to the aerobic system for longer periods of time in order to build endurance. Although these intervals also target Zone 4, riders will not be able to hold the same level of intensity as the shorter aerobic development drills. Part of this drill will be learning how to hold an effort just under the breaking point (threshold) where breathing becomes difficult. The length of time will often become the self-regulator.

> *Our goal is to ride at a level of intensity that makes you feel like you are teetering on the edge of your comfort zone.*
>
> *Let's begin by finding a leg speed of 80 RPM of above (use the tempo of the music, cadence check or bike computer).*

Now let's add enough resistance so we feel we are riding on a fast flat road. A good way to determine whether you have adequate resistance is if it is enough for you to stand safely.

Excellent! Now let's maintain this effort for the next [X] minutes.

[During recovery after the interval]
If you were not able to hold the effort you started you may need to decrease the amount of resistance. Experiment with this during the next endurance interval.

On the other side of the coin, if you were able to recovery (to easy breathing) from that effort in less than 60 seconds, you are most-likely not working at a high enough intensity. Try adding a bit more resistance during the next endurance interval.

Aerobic Endurance 4-6+ Minute Interval
Length: 4-6+ Minutes
Intensity: 70-75% PE / Zone 3 to Low Zone 4
Cadence: 80 – 100 RPM

After riders are able to maintain an aerobic interval for 2-3 minutes, you can challenge them with longer endurance efforts. Similar to the short 2-3 minute intervals, the purpose of this effort is to apply stress to the aerobic system for longer periods of time in order to build endurance. This drill further emphasizes the ability to hold an intensity level just under the breaking point (threshold) where breathing becomes difficult. The length of time will again become the self-regulator.

Similar to the 2-3 minute aerobic endurance efforts we did, these longer intervals will continue to help increase your endurance. Your goal is to hold an effort that challenges your ability to breath for [X] minutes. Just like the short efforts, you will need to learn how to regulate your intensity level to something that is hard but sustainable.

Let's begin by finding a leg speed of 80 RPM or above (use the tempo of the music, cadence check or bike computer).

Now let's add enough resistance so we feel we are riding on a fast flat road. A good way to determine whether you have adequate resistance is if it is enough for you to stand safely.

Excellent. Now let's maintain this effort for the next [X] minutes.

OPTION: Since we are going to be holding this level of effort for [4-6+] minutes, I will give you the option to stand for short 10 to 20 second periods each minute. For a visual, you can think of these standing efforts as small hills along the way. As you approach each hill or undulation in the road your goal is to stand without losing your cadence. These standing efforts may cause your heart rate to increase exponentially so be careful.

Active Recovery, Cool-down and Stretch

(5-8 Minutes)

After this workout, it is beneficial to put riders on an easy road for 2-3 minutes with a little bit of resistance. Target an intensity of 60-65% perceived exertion. This will keep their heart rates from plummeting while allowing the blood to do its magic, removing the byproducts of burning fuel and rehydrating the muscles and replenishing them with nutrients.

After 2-3 minutes, transition into stretching but always encourage riders to listen to their bodies and remain on the bike longer if needed.

THE MUSIC
Music selection is a key motivator in a workout like this. The bigger challenge is finding music that provides a cadence of 80-100 RPM (or BPM). You also will want to choose music that has a balance between not being too "mellow" or too intense. Particularly important for the aerobic endurance drills, the energy should be strong but steady to allow riders to settle in to a tempo or rhythm. Here is the music I used for these types of drills, all of which can be found on iTunes:

Song Title	Time	Artist	Focus
Mindfields	6:11	Toto	Aerobic Development
Mini Me	6:17	Tribal Tech	Aerobic Development
Under Siege	4:52	John Fitzpatrick	Aerobic Development
Auora More	6:58	Cloud2Ground	Aerobic Development
New Last Jam	4:16	Joe Satriani	Aerobic Development
I've Said	5:40	Tetris	Aerobic Endurance
The Chamber	5:37	Neal Schon	Aerobic Endurance
The Main Monkey Business	6:01	Rush	Aerobic Endurance
Phunk Pi	4:47	Neil Zaza	Aerobic Endurance
Greedy Fingers	5:10	Down to the Bone	Aerobic Endurance

NOTE: I will often use music editing software (Sony Acid Pro / MixMeister) to combine or alter the length of different songs to provide more time for the number of intervals or longer endurance efforts I plan to do (including provide time for intermediate recovery if needed).

Have Fun Building that Aerobic Base!

